

Net-Zero America - Maryland data

October 29, 2021 (updated November 17, 2023)

See the Data Sheet Guide for explanations of the contents of this document. The data herein underlie graphs and tables found in Princeton's Net-Zero America report:

E. Larson, C. Greig, J. Jenkins, E. Mayfield, A. Pascale, C. Zhang, J. Drossman, R. Williams, S. Pacala, R. Socolow, EJ Baik, R. Birdsey, R. Duke, R. Jones, B. Haley, E. Leslie, K. Paustian, and A. Swan, Net-Zero America: Potential Pathways, Infrastructure, and Impacts, Final Report, Princeton University, Princeton, NJ, 29 October 2021. Report available at https://net-zeroamerica.princeton.edu.

Contents

1	E+ scenario - IMPACTS - Health	1
2	E+ scenario - IMPACTS - Jobs	2
3	E+ scenario - IMPACTS - Fossil fuel industries	3
4	E+ scenario - PILLAR 1: Efficiency/Electrification - Overview	3
5	E+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand	3
6	E+ scenario - PILLAR 1: Efficiency/Electrification - Transportation	3
7	E+ scenario - PILLAR 1: Efficiency/Electrification - Residential	4
8	E+ scenario - PILLAR 1: Efficiency/Electrification - Commercial	4
9	E+ scenario - PILLAR 2: Clean Electricity - Generating capacity	4
10	E+ scenario - PILLAR 2: Clean Electricity - Generation	5
11	E+ scenario - PILLAR 3: Clean fuels - Bioenergy	5
12	E+ scenario - PILLAR 4: CCUS - CO2 capture	5
13	E+ scenario - PILLAR 4: CCUS - CO2 pipelines	6
14	E+ scenario - PILLAR 4: CCUS - CO2 storage	6
15	E+ scenario - PILLAR 6: Land sinks - Forests	6
16	E+ scenario - PILLAR 6: Land sinks - Agriculture	9
17	E- scenario - IMPACTS - Health	9
18	E- scenario - IMPACTS - Jobs	11
19	E- scenario - PILLAR 1: Efficiency/Electrification - Overview	12
20	E- scenario - PILLAR 1: Efficiency/Electrification - Electricity demand	12
21	E- scenario - PILLAR 1: Efficiency/Electrification - Transportation	12
22	E- scenario - PILLAR 1: Efficiency/Electrification - Residential	12
23	E- scenario - PILLAR 1: Efficiency/Electrification - Commercial	13
24	E- scenario - PILLAR 2: Clean Electricity - Generating capacity	13
25	E- scenario - PILLAR 6: Land sinks - Forests	13
26	E- scenario - PILLAR 6: Land sinks - Agriculture	15
27	E+RE+ scenario - IMPACTS - Health	16
28	E+RE+ scenario - IMPACTS - Jobs	18
29	E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Overview	19
30	E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand .	19
31	E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Transportation	19
32	E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Residential	19
33	E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Commercial	19
34	E+RE+ scenario - PILLAR 2: Clean Electricity - Generating capacity	20
35	E+RE+ scenario - PILLAR 2: Clean Electricity - Generation	20
36	E+RE+ scenario - PILLAR 6: Land sinks - Forests	20
37	E+RE+ scenario - PILLAR 6: Land sinks - Agriculture	23
38	E+RE- scenario - IMPACTS - Health	24
39	E+RE- scenario - IMPACTS - Jobs	25
40	E+RE- scenario - PILLAR 1: Efficiency/Electrification - Overview	26
41	${\sf E+RE-scenario-PILLAR1:Efficiency/Electrification-Electricitydemand} \ \ . \ \ .$	26
42	${\sf E+RE-scenario-PILLAR1:Efficiency/Electrification-Transportation}\ .\ .\ .\ .$	26
43	E+RE- scenario - PILLAR 1: Efficiency/Electrification - Residential	26

44	E+RE- scenario - PILLAR 1: Efficiency/Electrification - Commercial	27
45	E+RE- scenario - PILLAR 2: Clean Electricity - Generating capacity	27
46	E+RE- scenario - PILLAR 2: Clean Electricity - Generation	28
47	E+RE- scenario - PILLAR 6: Land sinks - Forests	28
48	E+RE- scenario - PILLAR 6: Land sinks - Agriculture	30
49	E-B+ scenario - IMPACTS - Health	31
50	E-B+ scenario - IMPACTS - Jobs	32
51	E-B+ scenario - PILLAR 1: Efficiency/Electrification - Overview	33
52	E-B+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand	34
53	E-B+ scenario - PILLAR 1: Efficiency/Electrification - Transportation	34
54	E-B+ scenario - PILLAR 1: Efficiency/Electrification - Residential	34
55	E-B+ scenario - PILLAR 1: Efficiency/Electrification - Commercial	34
56	E-B+ scenario - PILLAR 2: Clean Electricity - Generating capacity	35
57	E-B+ scenario - PILLAR 2: Clean Electricity - Generation	35
58	E-B+ scenario - PILLAR 3: Clean fuels - Bioenergy	35
59	E-B+ scenario - PILLAR 4: CCUS - CO2 capture	35
60	E-B+ scenario - PILLAR 4: CCUS - CO2 pipelines	35
61	E-B+ scenario - PILLAR 4: CCUS - CO2 storage	36
62	E-B+ scenario - PILLAR 6: Land sinks - Forests	36
63	E-B+ scenario - PILLAR 6: Land sinks - Agriculture	38
64	REF scenario - IMPACTS - Health	39
65	REF scenario - IMPACTS - Jobs	41
66	REF scenario - PILLAR 1: Efficiency/Electrification - Overview	42
67	REF scenario - PILLAR 1: Efficiency/Electrification - Electricity demand	42
68	REF scenario - PILLAR 1: Efficiency/Electrification - Residential	42
69	REF scenario - PILLAR 1: Efficiency/Electrification - Commercial	42
70	REF scenario - PILLAR 2: Clean Electricity - Generating capacity	43
71	REF scenario - PILLAR 2: Clean Electricity - Generation	43
72	REF scenario - PILLAR 6: Land sinks - Forests - REF only	43
73	REF scenario - PILLAR 6: Land sinks - Forests	43

Table 1: E+ scenario - IMPACTS - Health

Table 1: E+ scenario - IMPACTS - Health							
Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		83.9	0.057	0.056	0.052	0.036	0.003
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		28	20.9	13.9	12.6	7.41	3.09
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		246	229	173	100	44.8	16.5
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		17.5	16.1	12	6.99	3.22	1.34
Stations (deaths)							
Premature deaths from air pollution -		32.2	26.2	17.3	9.45	4.49	1.96
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		16	13	8.78	5	2.15	0.668
Fuel Comb - Residential - Oil (deaths)							
Premature deaths from air pollution -		4.19	3.77	2.93	2	1.18	0.679
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		1.88	1.8	1.72	1.63	1.54	1.44
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		35	30	21.2	12.8	7.49	4.58
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		9.17	7.3	5.23	3.42	2.23	1.44
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		2.59	2.21	1.83	1.44	1.06	0.704
Fuel Comb - Comm/Institutional - Other							
(deaths)							
Premature deaths from air pollution -		1.17	0.672	0.669	0.661	0.671	0.664
Industrial Processes - Coal Mining			0.0.2				
(deaths)							
Premature deaths from air pollution -		54.1	49.3	42.7	33.1	23.3	13.8
Industrial Processes - Oil & Gas		0	17.0	.2	30.1	20.0	10.0
Production (deaths)							
Monetary damages from air pollution -		744	0.505	0.5	0.458	0.318	0.027
Fuel Comb - Electric Generation - Coal			0.000	0.0	0.400	0.010	0.021
(million \$2019)							
Monetary damages from air pollution -		248	185	123	112	65.6	27.4
Fuel Comb - Electric Generation - Natural		240	103	123	112	03.0	21.4
Gas (million \$2019)							
Monetary damages from air pollution -		2,187	2,036	1,542	889	398	147
Mobile - On-Road (million \$2019)		2,101	2,030	1,042	007	370	141
Monetary damages from air pollution -		155	142	106	61.9	28.6	11.8
Gas Stations (million \$2019)		155	142	106	01.9	20.0	11.0
,		286	232	154	83.8	39.8	17.4
Monetary damages from air pollution -		286	232	154	83.8	39.8	17.4
Fuel Comb - Residential - Natural Gas							
(million \$2019)		1/0	115	77.0	/ / 0	10.1	F 00
Monetary damages from air pollution -		142	115	77.8	44.3	19.1	5.92
Fuel Comb - Residential - Oil (million							
\$2019)		074	00.7	25.0	477	10.5	
Monetary damages from air pollution -		37.1	33.4	25.9	17.7	10.5	6.02
Fuel Comb - Residential - Other (million							
\$2019)							
Monetary damages from air pollution -		16.6	15.9	15.2	14.4	13.6	12.7
Fuel Comb - Comm/Institutional - Coal							
(million \$2019)							
Monetary damages from air pollution -		310	265	188	113	66.3	40.5
Fuel Comb - Comm/Institutional - Natural							
Gas (million \$2019)							

Table 1: E+ scenario - IMPACTS - Health (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution -		81.2	64.6	46.3	30.2	19.8	12.8
Fuel Comb - Comm/Institutional - Oil							
(million \$2019)							
Monetary damages from air pollution -		23	19.6	16.2	12.7	9.42	6.24
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		10.4	5.93	5.91	5.84	5.92	5.86
Industrial Processes - Coal Mining							
(million \$2019)							
Monetary damages from air pollution -		480	438	379	294	207	123
Industrial Processes - Oil & Gas							
Production (million \$2019)							

Table 2: E+ scenario - IMPACTS - Jobs

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		49.8	101	38.7	30	22	337
By economic sector - Construction (jobs)		8,186	7,158	8,759	8,839	10,024	16,606
By economic sector - Manufacturing (jobs)		1,995	2,739	2,865	2,620	3,059	4,315
By economic sector - Mining (jobs)		1,387	923	589	350	190	100
By economic sector - Other (jobs)		1,189	1,070	1,356	1,467	1,712	2,649
By economic sector - Pipeline (jobs)		304	256	280	153	102	100
By economic sector - Professional (jobs)		3,402	3,072	3,620	3,926	4,519	7,61
By economic sector - Trade (jobs)		2,518	2,146	2,441	2,575	2,950	4,77
By economic sector - Utilities (jobs)		5,913	5,732	7,685	8,514	10,230	18,60
By resource sector - Biomass (jobs)		214	279	110	90.3	80.4	1,43
By resource sector - CO2 (jobs)		0	0	655	56	72.2	32
By resource sector - Coal (jobs)		803	212	0	0	0	(
By resource sector - Grid (jobs)		7,214	7,858	11,725	13,620	17,971	35,86
By resource sector - Natural Gas (jobs)		3,257	2,606	2,312	2,623	1,856	1,62
By resource sector - Nuclear (jobs)		923	908	894	880	866	67
By resource sector - Oil (jobs)		3,071	2,410	1,678	1,089	673	38
By resource sector - Solar (jobs)		9,148	8,282	9,383	8,809	9,300	12,42
By resource sector - Wind (jobs)		315	642	876	1,307	1,990	2,35
By education level - All sectors - High school diploma or less (jobs)		10,609	9,880	11,786	12,069	13,919	23,54
By education level - All sectors - Associates degree or some college (jobs)		7,901	7,370	8,922	9,245	10,690	17,94
By education level - All sectors - Bachelors degree (jobs)		5,016	4,644	5,404	5,570	6,375	10,56
By education level - All sectors - Masters or professional degree (jobs)		1,235	1,138	1,334	1,394	1,602	2,67
By education level - All sectors - Doctoral degree (jobs)		184	165	188	197	222	36
Related work experience - All sectors - None (jobs)		3,619	3,369	4,041	4,174	4,816	8,14
Related work experience - All sectors - Up to 1 year (jobs)		5,019	4,679	5,550	5,687	6,556	11,02
Related work experience - All sectors - 1 to 4 years (jobs)		8,970	8,327	9,906	10,221	11,775	19,77
Related work experience - All sectors - 4 to 10 years (jobs)		5,830	5,405	6,458	6,666	7,671	12,84
Related work experience - All sectors - Over 10 years (jobs)		1,506	1,416	1,679	1,726	1,989	3,31
On-the-Job Training - All sectors - None (jobs)		1,388	1,274	1,494	1,532	1,752	2,89
On-the-Job Training - All sectors - Up to 1 year (jobs)		16,172	15,111	17,873	18,392	21,199	35,62

Table 2. F+	scenario	- IMPACTS -	Inhe	(continued))
I a b i c Z . E T	Scellul lu	- IMPAGIS -	JUUS	ICUIILIIIUEUI	,

Item	2020	2025	2030	2035	2040	2045	2050
On-the-Job Training - All sectors - 1 to 4		5,342	4,953	5,992	6,195	7,149	12,014
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		1,797	1,628	2,007	2,087	2,404	4,073
years (jobs)							
On-the-Job Training - All sectors - Over 10		247	229	267	268	303	486
years (jobs)							
On-Site or In-Plant Training - All sectors -		4,050	3,765	4,447	4,571	5,243	8,711
None (jobs)							
On-Site or In-Plant Training - All sectors -		14,732	13,749	16,297	16,778	19,349	32,542
Up to 1 year (jobs)							
On-Site or In-Plant Training - All sectors -		4,134	3,837	4,630	4,781	5,519	9,282
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		1,813	1,644	2,010	2,084	2,395	4,048
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		216	202	249	259	301	513
Over 10 years (jobs)							
Wage income - All (million \$2019)		1,443	1,356	1,635	1,712	1,999	3,410

Table 3: E+ scenario - IMPACTS - Fossil fuel industries

Item	2020	2025	2030	2035	2040	2045	2050
Oil consumption - Annual (million bbls)		69.1	59.1	44.6	31.1	20.6	12.5
Oil consumption - Cumulative (million							1,382
bbls)							
Oil production - Annual (million bbls)		0	0	0	0	0	0
Natural gas consumption - Annual (tcf)		233	196	157	118	74.6	51.7
Natural gas consumption - Cumulative							4,741
(tcf)							
Natural gas production - Annual (tcf)		0.029	0.028	0.024	0.02	0.016	0.013

Table 4: E+ scenario - PILLAR 1: Efficiency/Electrification - Overview

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	448	417	367	305	249	213	197
Final energy use - Residential (PJ)	241	228	209	183	162	149	144
Final energy use - Commercial (PJ)	189	188	180	167	157	154	156
Final energy use - Industry (PJ)	130	132	132	141	151	159	167

Table 5: E+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		2.99	3.04	6	6.39	5.4	5.63
Cumulative 5-yr (billion \$2018)							

Table 6: E+ scenario - PILLAR 1: Efficiency/Electrification - Transportation

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	65.5	406	746	1,938	3,129	4,082	5,034
Vehicle stocks - LDV – All others (1000	4,197	3,997	3,796	2,766	1,737	983	228
units)							
Light-duty vehicle capital costs vs. REF -		800	2,073	3,321	5,046	5,475	5,229
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.402		1.31		5.5		8.84
units)							
Public EV charging plugs - L2 (1000 units)	1.67		31.5		132		212

Table 7: E+ scenario - PILLAR 1: Efficiency/Electrification - Residential

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric Heat Pump (%)	17.4	35.6	79.7	89.7	90.1	90.1	90.1
Sales of space heating units - Electric Resistance (%)	13.2	13.8	5.81	3.98	3.89	3.95	3.95
Sales of space heating units - Gas (%)	55.1	31.6	8.99	3.84	3.61	3.62	3.62
Sales of space heating units - Fossil (%)	14.3	18.9	5.51	2.51	2.38	2.35	2.35
Sales of water heating units - Electric Heat Pump (%)	0	9.19	48.7	57.6	58	58	58
Sales of water heating units - Electric Resistance (%)	35.7	51	42.2	40.3	40.2	40.2	40.2
Sales of water heating units - Gas Furnace (%)	59.5	36.5	7.04	0.317	0.002	0	0
Sales of water heating units - Other (%)	4.77	3.29	2.07	1.81	1.81	1.83	1.84
Sales of cooking units - Electric Resistance (%)	59.2	67.9	94.5	99.7	100	100	100
Sales of cooking units - Gas (%)	40.8	32.1	5.5	0.277	0	0	0
Residential HVAC investment in 2020s vs. REF - Cumulative 5-yr (billion \$2018)		4.8	4.71				

Table 8: E+ scenario - PILLAR 1: Efficiency/Electrification - Commercial

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	2.22	28.1	70.4	83.7	85	85.1	85.1
Heat Pump (%)							
Sales of space heating units - Electric	2.54	8.39	10.6	12.7	13.1	13.1	13.1
Resistance (%)							
Sales of space heating units - Gas (%)	84.3	59.3	18.3	3.58	1.9	1.86	1.85
Sales of space heating units - Fossil (%)	11	4.19	0.8	0.034	0	0	0
Sales of water heating units - Electric	0.097	10.5	54.4	64.3	64.7	64.8	64.7
Heat Pump (%)							
Sales of water heating units - Electric	2.5	10.8	28.3	32.3	32.5	32.5	32.5
Resistance (%)							
Sales of water heating units - Gas (%)	93	74.5	14.3	0.646	0.003	0	0
Sales of water heating units - Other (%)	4.44	4.22	3.02	2.72	2.72	2.72	2.71
Sales of cooking units - Electric	32	46	79.9	86.5	86.9	86.9	86.9
Resistance (%)							
Sales of cooking units - Gas (%)	68	54	20.1	13.5	13.1	13.1	13.1
Commercial HVAC investment in 2020s -		21,776	24,347				
Cumulative 5-yr (million \$2018)							

Table 9: E+ scenario - PILLAR 2: Clean Electricity - Generating capacity

Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	2,851	1,599	0	0	0	0	0
Installed thermal - Natural gas (MW)	4,401	6,790	7,271	7,956	10,343	10,506	10,333
Installed thermal - Nuclear (MW)	1,829	1,829	1,829	1,829	1,829	1,829	911
Installed renewables - Rooftop PV (MW)	851	1,276	1,695	2,240	2,899	3,650	4,510
Installed renewables - Solar - Base land use assumptions (MW)	809	4,104	5,824	7,813	8,889	10,195	10,378
Installed renewables - Wind - Base land use assumptions (MW)	191	191	191	191	191	191	191
Installed renewables - Offshore Wind - Base land use assumptions (MW)	0	0	0	0	0	4,288	15,370
Installed renewables - Solar - Constrained land use assumptions (MW)	532	3,826	4,335	5,450	6,017	7,371	7,986
Installed renewables - Wind - Constrained land use assumptions (MW)	191	191	191	263	2,069	2,069	2,069
Installed renewables - Offshore Wind - Constrained land use assumptions (MW)	0	0	0	0	0	989	15,372

Table O. F. cooperio	DILLADO, Ologo	Flootnicity Conception	a capacity (continued)
Table 9. E+ Scellulio	- PILLAR Z. GIBUII .	CIECUTICILY - GEHEFULHI	a CUDUCILY ICUIILIIIUEUT

Item	2020	2025	2030	2035	2040	2045	2050
Capital invested - Solar PV - Base (billion		4.41	2.06	2.19	1.12	1.28	0.169
\$2018)							
Capital invested - Offshore Wind - Base		0	0	0	0	6.33	14.7
(billion \$2018)							
Capital invested - Solar PV - Constrained		2.9	0.138	0.35	0	1.23	1.46
(billion \$2018)							
Capital invested - Wind - Constrained		0	0	0.457	3.71	0	0
(billion \$2018)							
Capital invested - Offshore Wind -		0	0	0	0	1.46	19.1
Constrained (billion \$2018)							
Capital invested - Biomass power plant	0	0	0	0	0	0	0
(billion \$2018)							
Capital invested - Biomass w/ccu allam	0	0	0	0	0	0	0
power plant (billion \$2018)							
Capital invested - Biomass w/ccu power	0	0	0	0	0	0	0
plant (billion \$2018)							

Table 10: E+ scenario - PILLAR 2: Clean Electricity - Generation

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	1,524	7,647	10,854	14,593	16,586	18,938	19,283
Wind - Base land use assumptions (GWh)	786	786	786	786	786	786	786
OffshoreWind - Base land use assumptions (GWh)	0	0	0	0	0	19,084	72,114
Solar - Constrained land use assumptions (GWh)	845	6,984	7,931	9,956	10,973	13,309	14,379
Wind - Constrained land use assumptions (GWh)	786	786	786	1,049	7,048	7,048	7,048
OffshoreWind - Constrained land use assumptions (GWh)	0	0	0	0	0	19,084	72,114
Biomass power plant (GWh)	0	0	0	0	0	0	0
Biomass w/ccu power plant (GWh)	0	0	0	0	0	0	0
Biomass w/ccu allam power plant (GWh)	0	0	0	0	0	0	0

Table 11: E+ scenario - PILLAR 3: Clean fuels - Bioenergy

Item	2020	2025	2030	2035	2040	2045	2050
Number of facilities - Power (quantity)	0	0	0	0	0	0	0
Number of facilities - Power ccu	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Allam power w ccu	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Beccs hydrogen	0	0	0	0	0	0	4
(quantity)							
Number of facilities - Diesel (quantity)	0	0	0	0	0	0	0
Number of facilities - Diesel ccu (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis ccu	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Sng (quantity)	0	0	0	0	0	0	0
Number of facilities - Sng ccu (quantity)	0	0	0	0	0	0	0
Conversion capital investment -		0	0	0	0	0	4,833
Cumulative 5-yr (million \$2018)							
Biomass purchases (million \$2018/y)		0	0	0	0	0	222

Table 12: E+ scenario - PILLAR 4: CCUS - CO2 capture

Item	2020	2025	2030	2035	2040	2045	2050
Annual - All (MMT)		0	0	0	3.32	3.42	9.75
Annual - BECCS (MMT)		0	0	0	0	0	6.21

Table 12: E+ scenario - PILLAR 4: CCUS - CO2 capture (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Annual - NGCC (MMT)		0	0	0	0	0	0
Annual - Cement and lime (MMT)		0	0	0	3.32	3.42	3.53
Cumulative - All (MMT)		0	0	0	3.32	6.74	16.5
Cumulative - BECCS (MMT)		0	0	0	0	0	6.21
Cumulative - NGCC (MMT)		0	0	0	0	0	0
Cumulative - Cement and lime (MMT)		0	0	0	3.32	6.74	10.3

Table 13: E+ scenario - PILLAR 4: CCUS - CO2 pipelines

Item	2020	2025	2030	2035	2040	2045	2050
Trunk (km)		0	0	112	112	112	112
Spur (km)		0	0	0	85.1	85.1	317
All (km)		0	0	112	197	197	429
Cumulative investment - Trunk (million \$2018)		0	0	667	667	667	667
Cumulative investment - Spur (million \$2018)		0	0	0	81.3	82.7	294
Cumulative investment - All (million \$2018)		0	0	667	748	749	961

Table 14: E+ scenario - PILLAR 4: CCUS - CO2 storage

Item	2020	2025	2030	2035	2040	2045	2050
Annual (MMT)		0	0	0	0	0	0
Injection wells (wells)		0	0	0	0	0	0
Resource characterization, appraisal, permitting costs (million \$2020)		0	0	0	0	0	0
Wells and facilities construction costs (million \$2020)		0	0	0	0	0	0

Table 15: E+ scenario - PILLAR 6: Land sinks - Forests

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-18.8
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-183
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-511
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-71.1
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-288
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-125
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-31.1
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-67.1
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-184
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-1,480
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-28.2
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-642
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-922
rotation length (1000 tCO2e/y)							

Table 15: E+ scenario - PILLAR 6: Land sinks - Forests (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Mid - Improve							-104
plantations (1000 tC02e/y)							
Carbon sink potential - Mid - Increase							-576
retention of HWP (1000 tC02e/y)							-240
Carbon sink potential - Mid - Increase trees outside forests (1000 tCO2e/y)							-240
Carbon sink potential - Mid - Reforest							-46.6
cropland (1000 tCO2e/y)							-40.0
Carbon sink potential - Mid - Reforest	+					+	-477
pasture (1000 tC02e/y)							711
Carbon sink potential - Mid - Restore						+	-365
productivity (1000 tC02e/y)							000
Carbon sink potential - Mid - All (not							-3,401
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Accelerate							-37.6
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-1,101
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-1,332
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-140
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-864
retention of HWP (1000 tC02e/y)							05/
Carbon sink potential - High - Increase							-356
trees outside forests (1000 tC02e/y)							/01
Carbon sink potential - High - Reforest cropland (1000 tCO2e/y)							-62.1
Carbon sink potential - High - Reforest							-886
pasture (1000 tC02e/y)							-000
Carbon sink potential - High - All (not	+					+	-5,324
counting overlap) (1000 tCO2e/y)							0,024
Carbon sink potential - High - Restore							-546
productivity (1000 tC02e/y)							0.0
Land impacted for carbon sink potential -							3.08
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							140
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							260
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							25.8
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							
hectares) Land impacted for carbon sink potential -							17.8
Low - Increase trees outside forests							17.0
(1000 hectares)							
Land impacted for carbon sink potential -	+						2.05
Low - Reforest cropland (1000 hectares)							2.00
Land impacted for carbon sink potential -							4.36
Low - Reforest pasture (1000 hectares)							⊣. 00
Land impacted for carbon sink potential -							110
Low - Restore productivity (1000							
hectares)							

Table 15: E+ scenario - PILLAR 6: Land sinks - Forests (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -				2000		20.0	563
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							4.61
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							144
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							470
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							38.8
Mid - Improve plantations (1000 hectares)							
Land impacted for carbon sink potential -							0
Mid - Increase retention of HWP (1000							
hectares)							05.0
Land impacted for carbon sink potential -							25.8
Mid - Increase trees outside forests (1000							
hectares)							3.08
Land impacted for carbon sink potential - Mid - Reforest cropland (1000 hectares)							3.08
Land impacted for carbon sink potential -							31.5
Mid - Reforest pasture (1000 hectares)							31.3
Land impacted for carbon sink potential -							221
Mid - Restore productivity (1000							221
hectares)							
Land impacted for carbon sink potential -							938
Mid - Total impacted (over 30 years) (1000							700
hectares)							
Land impacted for carbon sink potential -							6.15
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							149
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							679
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							51.5
High - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
High - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							33.8
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							4.11
High - Reforest cropland (1000 hectares)							05.0
Land impacted for carbon sink potential -							25.2
High - Reforest pasture (1000 hectares)							101
Land impacted for carbon sink potential -							181
High - Restore productivity (1000 hectares)							
Land impacted for carbon sink potential -							1,130
High - Total impacted (over 30 years)							1,130
(1000 hectares)							
(1000 1100tal 00)							

Table 16: E+ scenario - PILLAR 6: Land sinks - Agriculture

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 tC02e/y)							
Carbon sink potential - Moderate							-313
deployment - Cropland measures (1000							
tCO2e/v)							
Carbon sink potential - Moderate							-14.5
deployment - Permanent conservation							
cover (1000 tC02e/y)							
Carbon sink potential - Moderate							-327
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							0
deployment - Corn-ethanol to energy							•
grasses (1000 tC02e/y)							
Carbon sink potential - Aggressive							-595
deployment - Cropland measures (1000							070
tCO2e/y)							
Carbon sink potential - Aggressive							-29
deployment - Permanent conservation							_,
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-624
deployment - Total (1000 tCO2e/y)							0
Land impacted for carbon sink - Moderate							0
deployment - Corn-ethanol to energy							·
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							276
deployment - Cropland measures (1000							_
hectares)							
Land impacted for carbon sink - Moderate							26.4
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							302
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							0
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							525
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -			+				52.7
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							578
Aggressive deployment - Total (1000							0.0
hectares)							
,							

Table 17: E- scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		83.9	0.057	0.056	0.052	0.036	0.003
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		28	18.3	8.27	3.91	1.32	0.863
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		251	254	247	222	176	120
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		18	18.2	17.5	15.7	12.4	8.42
Stations (deaths)							

Table 17: E- scenario - IMPACTS - Health (continued)

Item 2	2020 2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -	32.5	29.9	26.4	21.5	15.7	10.2
Fuel Comb - Residential - Natural Gas						
(deaths)						
Premature deaths from air pollution -	16.3	15.7	15.2	13.3	9.81	6.08
Fuel Comb - Residential - Oil (deaths)						
Premature deaths from air pollution -	4.25	4.29	4.26	3.91	3.16	2.31
Fuel Comb - Residential - Other (deaths)						
Premature deaths from air pollution -	1.88	1.8	1.72	1.63	1.54	1.44
Fuel Comb - Comm/Institutional - Coal						
(deaths)	05.0	0/ 5	00.7	00.5	00.7	1/ 0
Premature deaths from air pollution -	35.3	34.5	32.7	28.5	22.4	16.2
Fuel Comb - Comm/Institutional - Natural Gas (deaths)						
Premature deaths from air pollution -	9.21	7.97	6.74	5.46	4.39	3.48
Fuel Comb - Comm/Institutional - Oil	7.21	1.21	0.14	3.40	4.57	3.40
(deaths)						
Premature deaths from air pollution -	2.59	2.37	2.14	1.9	1.67	1.43
Fuel Comb - Comm/Institutional - Other	2.07	2.01	2.14	1.7	1.01	1.40
(deaths)						
Premature deaths from air pollution -	1.14	0.673	0.674	0.669	0.672	0.649
Industrial Processes - Coal Mining						
(deaths)						
Premature deaths from air pollution -	53.9	46.5	37.2	30.2	25.2	18.2
Industrial Processes - Oil & Gas						
Production (deaths)						
Monetary damages from air pollution -	744	0.505	0.5	0.458	0.318	0.027
Fuel Comb - Electric Generation - Coal						
(million \$2019)						
Monetary damages from air pollution -	248	162	73.2	34.7	11.7	7.64
Fuel Comb - Electric Generation - Natural						
Gas (million \$2019)						
Monetary damages from air pollution -	2,231	2,262	2,199	1,975	1,567	1,069
Mobile - On-Road (million \$2019)	1=0			100	100	
Monetary damages from air pollution -	159	161	155	139	109	74.6
Gas Stations (million \$2019)	000	0/5	007	101	100	
Monetary damages from air pollution -	288	265	234	191	139	90
Fuel Comb - Residential - Natural Gas						
(million \$2019) Monetary damages from air pollution -	144	1/.0	107	117	86.9	53.8
Fuel Comb - Residential - Oil (million	144	140	134	117	86.9	55.6
\$2019)						
Monetary damages from air pollution -	37.6	38	37.7	34.7	28	20.5
Fuel Comb - Residential - Other (million	01.0	30	31.1	04.1	20	20.0
\$2019)						
Monetary damages from air pollution -	16.6	15.9	15.2	14.4	13.6	12.7
Fuel Comb - Comm/Institutional - Coal	10.0	10.7	.0.2		10.0	
(million \$2019)						
Monetary damages from air pollution -	312	306	289	252	198	143
Fuel Comb - Comm/Institutional - Natural						
Gas (million \$2019)						
Monetary damages from air pollution -	81.5	70.5	59.6	48.3	38.8	30.8
Fuel Comb - Comm/Institutional - Oil						
(million \$2019)						
Monetary damages from air pollution -	23	21	19	16.8	14.7	12.7
Fuel Comb - Comm/Institutional - Other						
(million \$2019)						
Monetary damages from air pollution -	10.1	5.94	5.95	5.91	5.93	5.73
Industrial Processes - Coal Mining						
(million \$2019)						

Table 17: E- scenario - IMPACTS - Health (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution -		478	413	330	268	224	162
Industrial Processes - Oil & Gas							
Production (million \$2019)							

Table 18: E- scenario - IMPACTS - Jobs

Table 18: E- scenario - IMPACTS - Jobs							
Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		60.7	77.8	29.7	19.1	17.3	337
By economic sector - Construction (jobs)		8,322	7,156	7,966	7,517	10,357	19,094
By economic sector - Manufacturing (jobs)		2,032	2,814	2,456	2,284	3,642	5,191
By economic sector - Mining (jobs)		1,399	963	704	501	338	187
By economic sector - Other (jobs)		1,225	1,089	1,231	1,323	1,735	2,800
By economic sector - Pipeline (jobs)		305	253	345	186	157	168
By economic sector - Professional (jobs)		3,448	3,039	3,237	3,374	4,642	8,567
By economic sector - Trade (jobs)		2,557	2,183	2,302	2,361	3,112	5,363
By economic sector - Utilities (jobs)		5,821	5,472	6,537	6,256	10,245	22,280
By resource sector - Biomass (jobs)		230	209	98.5	80.3	73.6	1,389
By resource sector - CO2 (jobs)		0	0	1,123	96	124	559
By resource sector - Coal (jobs)		803	212	0	0	0	0
By resource sector - Grid (jobs)		6,992	7,484	9,159	9,614	18,360	43,192
By resource sector - Natural Gas (jobs)		3,270	2,400	1,980	1,889	1,517	1,619
By resource sector - Nuclear (jobs)		923	908	894	880	866	853
By resource sector - Oil (jobs)		3,110	2,602	2,182	1,740	1,309	787
By resource sector - Solar (jobs)		9,517	8,563	8,527	8,251	9,558	12,439
By resource sector - Wind (jobs)		324	668	845	1,271	2,437	3,148
By education level - All sectors - High		10,716	9,823	10,581	10,099	14,561	27,365
school diploma or less (jobs)		.					•
By education level - All sectors -		7,966	7,309	7,969	7,652	11,108	20,844
Associates degree or some college (jobs)		.					
By education level - All sectors -		5,056	4,621	4,885	4,721	6,680	12,270
Bachelors degree (jobs)							
By education level - All sectors - Masters		1,245	1,129	1,202	1,178	1,666	3,097
or professional degree (jobs)							
By education level - All sectors - Doctoral		186	164	172	172	230	411
degree (jobs)							
Related work experience - All sectors -		3,651	3,343	3,626	3,477	5,017	9,451
None (jobs)							
Related work experience - All sectors - Up		5,076	4,660	4,982	4,791	6,861	12,760
to 1 year (jobs)							
Related work experience - All sectors - 1		9,046	8,270	8,899	8,554	12,292	22,982
to 4 years (jobs)							
Related work experience - All sectors - 4		5,877	5,365	5,798	5,558	7,992	14,932
to 10 years (jobs)							
Related work experience - All sectors -		1,518	1,408	1,504	1,442	2,084	3,862
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		1,403	1,272	1,354	1,307	1,833	3,341
(jobs)							
On-the-Job Training - All sectors - Up to 1		16,319	15,026	16,052	15,445	22,197	41,370
year (jobs)							
On-the-Job Training - All sectors - 1 to 4		5,385	4,910	5,362	5,126	7,424	13,983
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		1,812	1,609	1,798	1,715	2,473	4,730
years (jobs)							
On-the-Job Training - All sectors - Over 10		250	230	243	229	319	562
years (jobs)							
On-Site or In-Plant Training - All sectors -		4,092	3,745	4,002	3,852	5,475	10,075
None (jobs)		4/ 5//	40 / / 2	41.151	4/ 0=0	00.010	0= 00=
On-Site or In-Plant Training - All sectors -		14,864	13,669	14,634	14,073	20,249	37,807
Up to 1 year (jobs)							

Table 18: E- scenario - IMPACTS - Jobs (continued)

Item	2020	2025	2030	2035	2040	2045	2050
On-Site or In-Plant Training - All sectors -		4,168	3,806	4,145	3,965	5,740	10,802
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		1,828	1,626	1,806	1,720	2,470	4,705
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		218	199	221	212	311	597
Over 10 years (jobs)							
Wage income - All (million \$2019)		1,454	1,345	1,467	1,428	2,083	3,969

Table 19: E- scenario - PILLAR 1: Efficiency/Electrification - Overview

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	449	421	386	356	331	302	268
Final energy use - Residential (PJ)	241	229	222	214	200	183	167
Final energy use - Commercial (PJ)	189	189	186	183	177	171	167
Final energy use - Industry (PJ)	130	132	133	143	154	162	170

Table 20: E- scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		2.54	2.53	3.68	3.81	5.55	5.88
Cumulative 5-yr (billion \$2018)							

Table 21: E- scenario - PILLAR 1: Efficiency/Electrification - Transportation

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	50.7	151	250	713	1,176	2,200	3,224
Vehicle stocks - LDV – All others (1000	4,214	4,214	4,214	3,998	3,781	2,914	2,046
units)							
Light-duty vehicle capital costs vs. REF -		0	133	271	925	2,883	4,210
Cumulative 5-yr (million \$2018)							
Public EV charging plugs - DC Fast (1000	0.402		0.44		2.06		5.66
units)							
Public EV charging plugs - L2 (1000 units)	1.67		10.6		49.6		136

Table 22: E- scenario - PILLAR 1: Efficiency/Electrification - Residential

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	17.4	27.2	32.2	46.7	68.8	83.3	88.3
Heat Pump (%)							
Sales of space heating units - Electric	13.2	15.3	14.3	11.6	7.67	5.11	4.2
Resistance (%)							
Sales of space heating units - Gas (%)	55.1	36	33.4	26	14.6	7.13	4.52
Sales of space heating units - Fossil (%)	14.3	21.5	20.1	15.7	8.92	4.46	2.92
Sales of water heating units - Electric	0	1.58	6.08	19	38.9	51.9	56.4
Heat Pump (%)							
Sales of water heating units - Electric	35.7	52.7	51.6	48.7	44.3	41.5	40.5
Resistance (%)							
Sales of water heating units - Gas Furnace	59.5	42.2	38.9	29.2	14.4	4.62	1.21
(%)							
Sales of water heating units - Other (%)	4.77	3.53	3.4	3	2.4	2.02	1.89
Sales of cooking units - Electric	59	60.1	63.8	73.7	87.5	96	98.9
Resistance (%)							
Sales of cooking units - Gas (%)	41	39.9	36.2	26.3	12.5	4.04	1.09
Residential HVAC investment in 2020s vs.		4.8	4.72				
REF - Cumulative 5-yr (billion \$2018)							

Table 23: E- scenario - PILLAR 1: Efficiency/Electrification - Commercial

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	2.22	20.1	24.9	38.9	61	76.7	82.8
Heat Pump (%)							
Sales of space heating units - Electric	2.54	8.05	8.31	9.13	10.6	12	12.8
Resistance (%)							
Sales of space heating units - Gas (%)	84.3	67	62.3	48.5	26.7	10.8	4.34
Sales of space heating units - Fossil (%)	11	4.85	4.51	3.43	1.69	0.531	0.139
Sales of water heating units - Electric	0.097	2.03	7.02	21.4	43.5	57.9	63
Heat Pump (%)							
Sales of water heating units - Electric	2.5	7.39	9.34	15.1	24	29.8	31.8
Resistance (%)							
Sales of water heating units - Gas (%)	93	86.1	79.2	59.6	29.2	9.38	2.45
Sales of water heating units - Other (%)	4.44	4.46	4.4	3.91	3.31	2.91	2.76
Sales of cooking units - Electric	32	36.2	40.9	53.4	71	81.7	85.5
Resistance (%)							
Sales of cooking units - Gas (%)	68	63.8	59.1	46.6	29	18.3	14.5
Commercial HVAC investment in 2020s -		21,752	24,163				
Cumulative 5-yr (million \$2018)							

Table 24: E- scenario - PILLAR 2: Clean Electricity - Generating capacity

Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	2,851	1,599	0	0	0	0	0
Installed thermal - Natural gas (MW)	4,401	6,858	6,858	6,858	6,070	6,167	7,743
Installed thermal - Nuclear (MW)	1,829	1,829	1,829	1,829	1,829	1,829	1,829

Table 25: E- scenario - PILLAR 6: Land sinks - Forests

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-18.8
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-183
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-511
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-71.1
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-288
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-125
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-31.1
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-67.1
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-184
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-1,480
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-28.2
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-642
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-922
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-104
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-576
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-240
trees outside forests (1000 tCO2e/y)							

Table 25: E- scenario - PILLAR 6: Land sinks - Forests (continued)

Item Carbon sink potential - Mid - Reforest	2020	2025	2030	2035	2040	2045	2050 -46.6
cropland (1000 tC02e/y)							-40.0
Carbon sink potential - Mid - Reforest							-47
pasture (1000 tC02e/y)							-411
Carbon sink potential - Mid - Restore							-365
productivity (1000 tC02e/y)							000
Carbon sink potential - Mid - All (not							-3,401
counting overlap) (1000 tCO2e/y)							0, 101
Carbon sink potential - High - Accelerate							-37.6
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-1,101
deforestation (1000 tCO2e/y)							, -
Carbon sink potential - High - Extend							-1,332
rotation length (1000 tCO2e/y)							•
Carbon sink potential - High - Improve							-140
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-864
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-356
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-62.1
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-886
pasture (1000 tCO2e/y)							
Carbon sink potential - High - All (not							-5,324
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - High - Restore							-546
productivity (1000 tCO2e/y)							
Land impacted for carbon sink potential -							3.08
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							140
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							260
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							25.8
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							17.8
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							2.05
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							4.36
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							110
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							563
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							4.61
Mid - Accelerate regeneration (1000							
hectares)							

Table 25: E- scenario - PILLAR 6: Land sinks - Forests (continued)

Table 25: E- Scenario - PILLAR 6: Lana Sink		•					
Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							144
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							470
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							38.8
Mid - Improve plantations (1000 hectares)							
Land impacted for carbon sink potential -							0
Mid - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							25.8
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							3.08
Mid - Reforest cropland (1000 hectares)							0.00
Land impacted for carbon sink potential -							31.5
Mid - Reforest pasture (1000 hectares)							01.0
Land impacted for carbon sink potential -							221
Mid - Restore productivity (1000							221
hectares)							
Land impacted for carbon sink potential -							938
Mid - Total impacted (over 30 years) (1000							750
hectares)							
Land impacted for carbon sink potential -							6.15
High - Accelerate regeneration (1000							0.13
hectares)							
Land impacted for carbon sink potential -							149
High - Avoid deforestation (over 30 years)							147
(1000 hectares)							
Land impacted for carbon sink potential -							679
High - Extend rotation length (1000							019
hectares)							
Land impacted for carbon sink potential -							51.5
High - Improve plantations (1000							31.3
hectares) Land impacted for carbon sink potential -							0
High - Increase retention of HWP (1000							U
•							
hectares) Land impacted for carbon sink potential -							22.0
High - Increase trees outside forests							33.8
•							
(1000 hectares)							
Land impacted for carbon sink potential -							4.11
High - Reforest cropland (1000 hectares)							25.0
Land impacted for carbon sink potential -							25.2
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							181
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							1,130
High - Total impacted (over 30 years)							
(1000 hectares)							

Table 26: E- scenario - PILLAR 6: Land sinks - Agriculture

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							

Table 26: E- scenario - PILLAR 6: Land sinks - Agriculture (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-313
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-14.5
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-327
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							0
deployment - Corn-ethanol to energy							
grasses (1000 tC02e/y)							
Carbon sink potential - Aggressive							-595
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-29
deployment - Permanent conservation							_,
cover (1000 tC02e/y)							
Carbon sink potential - Aggressive							-624
deployment - Total (1000 tC02e/y)							024
Land impacted for carbon sink - Moderate		+					0
deployment - Corn-ethanol to energy							U
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate		+					276
•							210
deployment - Cropland measures (1000							
hectares)							26.4
Land impacted for carbon sink - Moderate							26.4
deployment - Permanent conservation							
cover (1000 hectares)							200
Land impacted for carbon sink - Moderate							302
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							0
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							525
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							52.7
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							578
Aggressive deployment - Total (1000							
hectares)							

Table 27: E+RE+ scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution - Fuel Comb - Electric Generation - Coal (deaths)		83.9	0.057	0.056	0.052	0.036	0.003
Premature deaths from air pollution - Fuel Comb - Electric Generation - Natural Gas (deaths)		25.7	18	11.2	7.87	2.76	0.525
Premature deaths from air pollution - Mobile - On-Road (deaths)		246	229	173	100	44.8	16.5
Premature deaths from air pollution - Gas Stations (deaths)		17.5	16.1	12	6.99	3.22	1.34
Premature deaths from air pollution - Fuel Comb - Residential - Natural Gas (deaths)		32.2	26.2	17.3	9.45	4.49	1.96
Premature deaths from air pollution - Fuel Comb - Residential - Oil (deaths)		16	13	8.78	5	2.15	0.668

Table 27: E+RE+ scenario - IMPACTS - Health (continued)

Item Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		4.19	3.77	2.93	2	1.18	0.679
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Coal (deaths)		1.88	1.8	1.72	1.63	1.54	1.44
Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (deaths)		35	30	21.2	12.8	7.49	4.58
Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths)		9.17	7.3	5.23	3.42	2.23	1.44
Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Other (deaths)		2.59	2.21	1.83	1.44	1.06	0.704
Premature deaths from air pollution - Industrial Processes - Coal Mining (deaths)		1.26	0.672	0.669	0.661	0.67	0.63
Premature deaths from air pollution - Industrial Processes - Oil & Gas Production (deaths)		52.7	48.2	38.9	27.5	15.3	1.37
Monetary damages from air pollution - Fuel Comb - Electric Generation - Coal (million \$2019)		744	0.505	0.5	0.458	0.318	0.027
Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019)		228	159	99	69.7	24.4	4.65
Monetary damages from air pollution - Mobile - On-Road (million \$2019)		2,187	2,036	1,542	889	398	147
Monetary damages from air pollution - Gas Stations (million \$2019)		155	142	106	61.9	28.6	11.8
Monetary damages from air pollution - Fuel Comb - Residential - Natural Gas (million \$2019)		286	232	154	83.8	39.8	17.4
Monetary damages from air pollution - Fuel Comb - Residential - Oil (million \$2019)		142	115	77.8	44.3	19.1	5.92
Monetary damages from air pollution - Fuel Comb - Residential - Other (million \$2019)		37.1	33.4	25.9	17.7	10.5	6.02
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Coal (million \$2019)		16.6	15.9	15.2	14.4	13.6	12.7
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (million \$2019)		310	265	188	113	66.3	40.5
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Oil (million \$2019)		81.2	64.6	46.3	30.2	19.8	12.8
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Other (million \$2019)		23	19.6	16.2	12.7	9.42	6.24
Monetary damages from air pollution - Industrial Processes - Coal Mining (million \$2019)		11.1	5.93	5.9	5.83	5.91	5.56
Monetary damages from air pollution - Industrial Processes - Oil & Gas Production (million \$2019)		468	428	345	244	136	12.1

Table 28: E+RE+ scenario - IMPACTS - Jobs

Table 28: E+RE+ scenario - IMPACTS - Jobs							
Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		50.1	104	38.4	24.5	19.8	336
By economic sector - Construction (jobs)		8,263	6,039	8,057	9,465	16,290	21,122
By economic sector - Manufacturing (jobs)		2,300	2,742	3,850	3,274	4,510	5,869
By economic sector - Mining (jobs)		1,375	901	541	282	116	16.5
By economic sector - Other (jobs)		1,207	839	1,303	1,675	2,548	5,020
By economic sector - Pipeline (jobs)		296	246	172	108	57.7	23.4
By economic sector - Professional (jobs)		3,428	2,688	3,488	4,253	7,088	10,610
By economic sector - Trade (jobs)		2,533	1,874	2,346	2,794	4,506	7,188
By economic sector - Utilities (jobs)		5,919	5,325	6,702	7,945	17,232	15,240
By resource sector - Biomass (jobs)		195	293	103	80	73.4	1,479
By resource sector - CO2 (jobs)		0	0	0	0	0	0
By resource sector - Coal (jobs)		803	212	0	0	0	0
By resource sector - Grid (jobs)		7,287	7,172	10,833	13,823	34,407	29,633
By resource sector - Natural Gas (jobs)		3,168	2,460	1,996	2,118	1,518	1,511
By resource sector - Nuclear (jobs)		923	908	710	258	0	0
By resource sector - Oil (jobs)		3,072	2,376	1,606	924	407	0.019
By resource sector - Solar (jobs)		9,582	6,596	9,854	10,336	12,355	29,084
By resource sector - Wind (jobs)		339	741	1,394	2,280	3,607	3,717
By education level - All sectors - High		10,801	8,809	11,312	12,691	22,363	27,811
school diploma or less (jobs)							
By education level - All sectors -		8,037	6,576	8,523	9,701	17,186	21,253
Associates degree or some college (jobs)							
By education level - All sectors -		5,096	4,202	5,208	5,780	9,974	12,641
Bachelors degree (jobs)			1.00/	1.000	1110		
By education level - All sectors - Masters or professional degree (jobs)		1,251	1,024	1,272	1,442	2,510	3,233
By education level - All sectors - Doctoral		186	146	180	206	336	486
degree (jobs)							
Related work experience - All sectors -		3,678	3,009	3,853	4,368	7,723	9,631
None (jobs)							
Related work experience - All sectors - Up		5,116	4,166	5,372	6,017	10,445	13,410
to 1 year (jobs)							
Related work experience - All sectors - 1		9,117	7,465	9,481	10,674	18,788	23,381
to 4 years (jobs)							
Related work experience - All sectors - 4		5,924	4,841	6,164	6,958	12,250	15,127
to 10 years (jobs)							
Related work experience - All sectors -		1,536	1,278	1,625	1,802	3,161	3,874
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		1,410	1,135	1,437	1,608	2,742	3,610
(jobs)							
On-the-Job Training - All sectors - Up to 1 year (jobs)		16,468	13,572	17,261	19,289	33,736	42,414
On-the-Job Training - All sectors - 1 to 4		5,426	4,417	5,683	6,467	11,508	14,029
years (jobs)		5,426	4,417	5,663	6,467	11,508	14,029
On-the-Job Training - All sectors - 4 to 10		1,814	1,431	1,852	2,171	3,911	4,756
years (jobs)		1,014	1,401	1,002	2,111	0,711	4,100
On-the-Job Training - All sectors - Over 10		252	204	262	285	470	615
years (jobs)							0.0
On-Site or In-Plant Training - All sectors -		4,123	3,364	4,289	4,808	8,275	10,652
None (jobs)		, -		, -	,	-, -	-,
On-Site or In-Plant Training - All sectors -		14,997	12,341	15,708	17,580	30,840	38,608
Up to 1 year (jobs)		,	,-	,	,		,
On-Site or In-Plant Training - All sectors -		4,201	3,423	4,403	4,997	8,882	10,861
1 to 4 years (jobs)		, -	-, -	,	,	-,	.,
On-Site or In-Plant Training - All sectors -		1,831	1,451	1,861	2,164	3,880	4,712
4 to 10 years (jobs)		,	, -	,	, -		, -
On-Site or In-Plant Training - All sectors -		220	180	235	272	492	591
Over 10 years (jobs)							
Wage income - All (million \$2019)		1,465	1,218	1,559	1,777	3,187	3,968
		•		•	•	•	•

Table 29: E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Overview

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	448	417	367	305	249	213	197
Final energy use - Residential (PJ)	241	228	209	183	162	149	144
Final energy use - Commercial (PJ)	189	188	180	167	157	154	156
Final energy use - Industry (PJ)	130	132	132	141	151	159	167

Table 30: E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		2.99	3.04	6	6.39	5.4	5.63
Cumulative 5-yr (billion \$2018)							

Table 31: E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Transportation

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	65.5	406	746	1,938	3,129	4,082	5,034
Vehicle stocks - LDV – All others (1000 units)	4,197	3,997	3,796	2,766	1,737	983	228
Light-duty vehicle capital costs vs. REF - Cumulative 5-yr (million \$2018)		800	2,073	3,321	5,046	5,475	5,229
Public EV charging plugs - DC Fast (1000 units)	0.402		1.31		5.5		8.84
Public EV charging plugs - L2 (1000 units)	1.67		31.5		132		212

Table 32: E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Residential

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	17.4	35.6	79.7	89.7	90.1	90.1	90.1
Heat Pump (%)							
Sales of space heating units - Electric	13.2	13.8	5.81	3.98	3.89	3.95	3.95
Resistance (%)							
Sales of space heating units - Gas (%)	55.1	31.6	8.99	3.84	3.61	3.62	3.62
Sales of space heating units - Fossil (%)	14.3	18.9	5.51	2.51	2.38	2.35	2.35
Sales of water heating units - Electric	0	9.19	48.7	57.6	58	58	58
Heat Pump (%)							
Sales of water heating units - Electric	35.7	51	42.2	40.3	40.2	40.2	40.2
Resistance (%)							
Sales of water heating units - Gas Furnace	59.5	36.5	7.04	0.317	0.002	0	0
(%)							
Sales of water heating units - Other (%)	4.77	3.29	2.07	1.81	1.81	1.83	1.84
Sales of cooking units - Electric	59.2	67.9	94.5	99.7	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	40.8	32.1	5.5	0.277	0	0	0
Residential HVAC investment in 2020s vs.		4.8	4.71				
REF - Cumulative 5-yr (billion \$2018)							

Table 33: E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Commercial

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	2.22	28.1	70.4	83.7	85	85.1	85.1
Heat Pump (%)							
Sales of space heating units - Electric	2.54	8.39	10.6	12.7	13.1	13.1	13.1
Resistance (%)							
Sales of space heating units - Gas (%)	84.3	59.3	18.3	3.58	1.9	1.86	1.85
Sales of space heating units - Fossil (%)	11	4.19	0.8	0.034	0	0	0
Sales of water heating units - Electric	0.097	10.5	54.4	64.3	64.7	64.8	64.7
Heat Pump (%)							
Sales of water heating units - Electric	2.5	10.8	28.3	32.3	32.5	32.5	32.5
Resistance (%)							
Sales of water heating units - Gas (%)	93	74.5	14.3	0.646	0.003	0	0
Sales of water heating units - Other (%)	4.44	4.22	3.02	2.72	2.72	2.72	2.71

Table 33: E+RE+ scenario - PILLAR 1: Efficiency/Electrification - Commercial (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Sales of cooking units - Electric	32	46	79.9	86.5	86.9	86.9	86.9
Resistance (%)							
Sales of cooking units - Gas (%)	68	54	20.1	13.5	13.1	13.1	13.1
Commercial HVAC investment in 2020s -		21,776	24,347				
Cumulative 5-yr (million \$2018)							

Table 34: E+RE+ scenario - PILLAR 2: Clean Electricity - Generating capacity

		,	3 - 1	- /			
Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	2,851	1,599	0	0	0	0	0
Installed thermal - Natural gas (MW)	4,401	6,754	6,982	7,583	9,493	9,207	10,165
Installed thermal - Nuclear (MW)	1,829	1,829	1,829	911	0	0	0
Installed renewables - Rooftop PV (MW)	851	1,276	1,695	2,240	2,899	3,650	4,510
Installed renewables - Solar - Base land	972	4,354	4,700	6,660	9,052	12,770	28,882
use assumptions (MW)							
Installed renewables - Wind - Base land	191	191	191	191	191	1,394	4,802
use assumptions (MW)							
Installed renewables - Offshore Wind -	0	0	0	0	987	12,663	15,370
Base land use assumptions (MW)							
Installed renewables - Solar -	1,309	3,030	4,675	7,213	8,857	9,127	28,742
Constrained land use assumptions (MW)							
Installed renewables - Wind - Constrained	219	219	219	1,831	3,540	3,540	3,540
land use assumptions (MW)							
Installed renewables - Offshore Wind -	0	0	0	0	989	989	15,372
Constrained land use assumptions (MW)							
Capital invested - Solar PV - Base (billion		4.53	0.414	2.16	2.49	3.65	14.9
\$2018)							
Capital invested - Wind - Base (billion		0	0	0	0	2.43	6.5
\$2018)							
Capital invested - Offshore Wind - Base		0	0	0	1.71	17.2	3.59
(billion \$2018)							

Table 35: E+RE+ scenario - PILLAR 2: Clean Electricity - Generation

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	1,833	8,064	8,720	12,261	16,434	22,811	52,725
Wind - Base land use assumptions (GWh)	786	786	786	786	786	4,950	14,593
OffshoreWind - Base land use assumptions (GWh)	0	0	0	0	4,268	58,926	72,114
Solar - Constrained land use assumptions (GWh)	4,898	11,221	17,264	26,520	32,278	33,228	105,973
Wind - Constrained land use assumptions (GWh)	1,572	1,572	1,572	12,555	21,470	21,470	21,470
OffshoreWind - Constrained land use assumptions (GWh)	0	0	0	0	8,552	8,552	144,242

Table 36: E+RE+ scenario - PILLAR 6: Land sinks - Forests

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate regeneration (1000 tCO2e/y)							-18.8
Carbon sink potential - Low - Avoid deforestation (1000 tCO2e/y)							-183
Carbon sink potential - Low - Extend rotation length (1000 tCO2e/y)							-511
Carbon sink potential - Low - Improve plantations (1000 tCO2e/y)							-71.1
Carbon sink potential - Low - Increase retention of HWP (1000 tCO2e/y)							-288

Table 36: E+RE+ scenario - PILLAR 6: Land sinks - Forests (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Increase							-125
trees outside forests (1000 tC02e/y)							01
Carbon sink potential - Low - Reforest cropland (1000 tCO2e/y)							-31.
Carbon sink potential - Low - Reforest							-67.
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-184
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-1,480
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-28.2
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-642
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-922
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-104
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-576
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-240
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-46.6
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-477
pasture (1000 tCO2e/y)							
Carbon sink potential - Mid - Restore							-365
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - All (not							-3,40
counting overlap) (1000 tCO2e/y)							-,
Carbon sink potential - High - Accelerate							-37.6
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-1,10
deforestation (1000 tC02e/y)							.,
Carbon sink potential - High - Extend							-1,332
rotation length (1000 tC02e/y)							1,002
Carbon sink potential - High - Improve							-140
plantations (1000 tC02e/y)							1-10
Carbon sink potential - High - Increase							-864
retention of HWP (1000 tC02e/y)							-002
Carbon sink potential - High - Increase							-356
trees outside forests (1000 tC02e/y)							-550
Carbon sink potential - High - Reforest	-						-62.
cropland (1000 tCO2e/y)							-02.
Carbon sink potential - High - Reforest							-886
							-886
pasture (1000 tCO2e/y)							F 00/
Carbon sink potential - High - All (not							-5,324
counting overlap) (1000 tC02e/y)							
Carbon sink potential - High - Restore							-546
productivity (1000 tCO2e/y)							
Land impacted for carbon sink potential -							3.08
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							140
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							260
Low - Extend rotation length (1000							
hectares)							

Table 36: E+RE+ scenario - PILLAR 6: Land sinks - Forests (continued)

Item Land impacted for carbon sink potential -	2020	2025	2030	2035	2040	2045	2050 25.8
Low - Improve plantations (1000							23.0
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							17.8
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							2.05
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							4.36
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							110
Low - Restore productivity (1000							110
hectares)							
Land impacted for carbon sink potential -							563
·							303
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							4.61
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							144
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							470
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							38.8
Mid - Improve plantations (1000 hectares)							
Land impacted for carbon sink potential -							0
Mid - Increase retention of HWP (1000							J
hectares)							
Land impacted for carbon sink potential -			-				25.8
Mid - Increase trees outside forests (1000							20.0
hectares)							
Land impacted for carbon sink potential -							3.08
·							3.00
Mid - Reforest cropland (1000 hectares)							01.5
Land impacted for carbon sink potential -							31.5
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							221
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							938
Mid - Total impacted (over 30 years) (1000							
hectares)							
Land impacted for carbon sink potential -							6.15
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							149
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							679
High - Extend rotation length (1000							017
hectares)							F4 F
Land impacted for carbon sink potential -							51.5
High - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
High - Increase retention of HWP (1000							
hectares)	1	1					

Table 36: E+RE+ scenario - PILLAR 6: Land sinks - Forests (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							33.8
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							4.11
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							25.2
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							181
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							1,130
High - Total impacted (over 30 years)							
(1000 hectares)							

Table 37: E+RE+ scenario - PILLAR 6: Land			0000	0005	00/0	0015	0050
Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 tC02e/y)							
Carbon sink potential - Moderate							-313
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-14.5
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-327
deployment - Total (1000 tCO2e/y)							
Carbon sink potential - Aggressive							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-595
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-29
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-624
deployment - Total (1000 tC02e/y)							
Land impacted for carbon sink - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							276
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							26.4
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							302
deployment - Total (1000 hectares)							002
Land impacted for carbon sink -							0
Aggressive deployment - Corn-ethanol to							U
energy grasses (1000 hectares)							
Land impacted for carbon sink -							525
Aggressive deployment - Cropland							323
measures (1000 hectares) Land impacted for carbon sink -							52.7
							52.7
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							

Table 37: E+RE+ scenario - PILLAR 6: Land sinks - Agriculture (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink - Aggressive deployment - Total (1000 hectares)							578

Table 38: E+RE- scenario - IMPACTS - Health

Item Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -	2020	83.9	0.057	0.056	0.052	0.036	0.003
Fuel Comb - Electric Generation - Coal		00.7	0.001	0.000	0.002	0.000	0.000
(deaths)							
Premature deaths from air pollution -		22.9	18	23.2	17.7	6.19	1.89
Fuel Comb - Electric Generation - Natural		22.7	.0	20.2		0.17	1.07
Gas (deaths)							
Premature deaths from air pollution -		246	229	173	100	44.8	16.5
Mobile - On-Road (deaths)		240	227	113	100	44.0	10.5
Premature deaths from air pollution - Gas		17.5	16.1	12	6.99	3.22	1.34
Stations (deaths)		11.5	10.1	12	0.77	3.22	1.54
Premature deaths from air pollution -		32.2	26.2	17.3	9.45	4.49	1.96
Fuel Comb - Residential - Natural Gas		32.2	20.2	17.5	9.45	4.49	1.90
(deaths)		1/	10	0.70	-	0.15	0.//0
Premature deaths from air pollution -		16	13	8.78	5	2.15	0.668
Fuel Comb - Residential - Oil (deaths)			0.77	0.00		110	0 (70
Premature deaths from air pollution -		4.19	3.77	2.93	2	1.18	0.679
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		1.88	1.8	1.72	1.63	1.54	1.44
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		35	30	21.2	12.8	7.49	4.58
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		9.17	7.3	5.23	3.42	2.23	1.44
Fuel Comb - Comm/Institutional - Oil							
(deaths)							
Premature deaths from air pollution -		2.59	2.21	1.83	1.44	1.06	0.704
Fuel Comb - Comm/Institutional - Other							
(deaths)							
Premature deaths from air pollution -		1.09	0.671	0.669	0.661	0.671	0.63
Industrial Processes - Coal Mining							
(deaths)							
Premature deaths from air pollution -		55	52.4	51	44.8	37.6	28.3
Industrial Processes - Oil & Gas				-			
Production (deaths)							
Monetary damages from air pollution -		744	0.505	0.5	0.458	0.318	0.027
Fuel Comb - Electric Generation - Coal		177	0.000	0.0	0.400	0.010	0.021
(million \$2019)							
Monetary damages from air pollution -		202	159	206	157	54.8	16.7
Fuel Comb - Electric Generation - Natural		202	107	200	101	04.0	10.1
Gas (million \$2019)							
Monetary damages from air pollution -		2,187	2,036	1,542	889	398	147
Mobile - On-Road (million \$2019)		2,101	2,030	1,542	007	370	141
Monetary damages from air pollution -		155	142	106	61.9	28.6	11.8
Gas Stations (million \$2019)		155	142	106	01.9	20.0	11.0
		007	000	157	00.0	20.0	17 /
Monetary damages from air pollution -		286	232	154	83.8	39.8	17.4
Fuel Comb - Residential - Natural Gas							
(million \$2019)		1/0	445			101	
Monetary damages from air pollution -		142	115	77.8	44.3	19.1	5.92
Fuel Comb - Residential - Oil (million							
\$2019)							
Monetary damages from air pollution -		37.1	33.4	25.9	17.7	10.5	6.02
Fuel Comb - Residential - Other (million							
\$2019)							

Table 38: E+RE- scenario - IMPACTS - Health (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution -		16.6	15.9	15.2	14.4	13.6	12.7
Fuel Comb - Comm/Institutional - Coal							
(million \$2019)							
Monetary damages from air pollution -		310	265	188	113	66.3	40.5
Fuel Comb - Comm/Institutional - Natural							
Gas (million \$2019)							
Monetary damages from air pollution -		81.2	64.6	46.3	30.2	19.8	12.8
Fuel Comb - Comm/Institutional - Oil							
(million \$2019)							
Monetary damages from air pollution -		23	19.6	16.2	12.7	9.42	6.24
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		9.65	5.92	5.91	5.83	5.92	5.56
Industrial Processes - Coal Mining							
(million \$2019)							
Monetary damages from air pollution -		489	466	453	398	334	251
Industrial Processes - Oil & Gas							
Production (million \$2019)							

Table 39: E+RE- scenario - IMPACTS - Jobs

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		57	81.6	27.3	22.5	20.7	337
By economic sector - Construction (jobs)		5,240	4,938	6,370	5,967	6,631	8,456
By economic sector - Manufacturing		1,623	1,545	1,554	1,344	1,651	1,514
(jobs)							
By economic sector - Mining (jobs)		1,399	943	634	402	248	159
By economic sector - Other (jobs)		661	685	857	958	1,073	1,796
By economic sector - Pipeline (jobs)		311	270	392	212	172	199
By economic sector - Professional (jobs)		2,303	2,124	2,559	2,573	3,726	4,827
By economic sector - Trade (jobs)		1,842	1,593	1,753	1,748	2,164	2,953
By economic sector - Utilities (jobs)		4,462	4,136	6,726	5,868	12,117	10,636
By resource sector - Biomass (jobs)		199	209	93.5	84.1	81.2	1,401
By resource sector - CO2 (jobs)		0	0	1,268	109	140	632
By resource sector - Coal (jobs)		803	212	0	0	0	0
By resource sector - Grid (jobs)		4,794	4,829	7,847	8,252	10,016	10,288
By resource sector - Natural Gas (jobs)		2,817	2,428	2,303	2,376	2,385	2,458
By resource sector - Nuclear (jobs)		923	908	1,846	1,072	8,122	5,483
By resource sector - Oil (jobs)		3,071	2,410	1,678	1,089	708	484
By resource sector - Solar (jobs)		4,979	4,910	5,424	5,588	5,721	9,486
By resource sector - Wind (jobs)		314	408	412	524	629	644
By education level - All sectors - High		7,546	6,907	8,806	8,068	11,173	12,705
school diploma or less (jobs)							
By education level - All sectors -		5,600	5,132	6,689	6,161	8,669	9,708
Associates degree or some college (jobs)							
By education level - All sectors -		3,715	3,337	4,193	3,782	6,146	6,510
Bachelors degree (jobs)							
By education level - All sectors - Masters or professional degree (jobs)		906	819	1,039	949	1,584	1,694
By education level - All sectors - Doctoral		132	119	146	135	232	259
degree (jobs)							
Related work experience - All sectors -		2,585	2,368	3,045	2,797	3,942	4,468
None (jobs)							
Related work experience - All sectors - Up to 1 year (jobs)		3,550	3,253	4,117	3,789	5,407	6,174
Related work experience - All sectors - 1		6,477	5,884	7,517	6,870	10,094	11,134
to 4 years (jobs)							•
Related work experience - All sectors - 4 to 10 years (jobs)		4,192	3,813	4,913	4,481	6,577	7,208

Table 39: E+RE- scenario - IMPACTS - Jobs (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Related work experience - All sectors -		1,096	996	1,280	1,158	1,783	1,891
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		995	904	1,136	1,037	1,589	1,760
(jobs)							
On-the-Job Training - All sectors - Up to 1		11,692	10,633	13,471	12,315	18,172	20,148
year (jobs)							
On-the-Job Training - All sectors - 1 to 4		3,795	3,473	4,540	4,155	5,906	6,526
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		1,244	1,145	1,524	1,408	1,871	2,152
years (jobs)							
On-the-Job Training - All sectors - Over 10		174	160	201	180	266	290
years (jobs)							
On-Site or In-Plant Training - All sectors -		2,897	2,644	3,355	3,066	4,578	5,090
None (jobs)							
On-Site or In-Plant Training - All sectors -		10,641	9,677	12,297	11,241	16,545	18,318
Up to 1 year (jobs)							
On-Site or In-Plant Training - All sectors -		2,941	2,690	3,498	3,204	4,540	5,033
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		1,269	1,164	1,536	1,411	1,916	2,175
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		152	140	185	172	225	260
Over 10 years (jobs)							
Wage income - All (million \$2019)		1,046	962	1,254	1,156	1,785	1,959

Table 40: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Overview

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	448	417	367	305	249	213	197
Final energy use - Residential (PJ)	241	228	209	183	162	149	144
Final energy use - Commercial (PJ)	189	188	180	167	157	154	156
Final energy use - Industry (PJ)	130	132	132	141	151	159	167

Table 41: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		2.99	3.04	6	6.39	5.4	5.63
Cumulative 5-yr (billion \$2018)							

Table 42: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Transportation

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	65.5	406	746	1,938	3,129	4,082	5,034
Vehicle stocks - LDV – All others (1000 units)	4,197	3,997	3,796	2,766	1,737	983	228
Light-duty vehicle capital costs vs. REF - Cumulative 5-yr (million \$2018)		800	2,073	3,321	5,046	5,475	5,229
Public EV charging plugs - DC Fast (1000 units)	0.402		1.31		5.5		8.84
Public EV charging plugs - L2 (1000 units)	1.67		31.5		132		212

Table 43: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Residential

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	17.4	35.6	79.7	89.7	90.1	90.1	90.1
Heat Pump (%)							
Sales of space heating units - Electric	13.2	13.8	5.81	3.98	3.89	3.95	3.95
Resistance (%)							
Sales of space heating units - Gas (%)	55.1	31.6	8.99	3.84	3.61	3.62	3.62
Sales of space heating units - Fossil (%)	14.3	18.9	5.51	2.51	2.38	2.35	2.35

Table 43: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Residential (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Sales of water heating units - Electric	0	9.19	48.7	57.6	58	58	58
Heat Pump (%)							
Sales of water heating units - Electric	35.7	51	42.2	40.3	40.2	40.2	40.2
Resistance (%)							
Sales of water heating units - Gas Furnace	59.5	36.5	7.04	0.317	0.002	0	0
(%)							
Sales of water heating units - Other (%)	4.77	3.29	2.07	1.81	1.81	1.83	1.84
Sales of cooking units - Electric	59.2	67.9	94.5	99.7	100	100	100
Resistance (%)							
Sales of cooking units - Gas (%)	40.8	32.1	5.5	0.277	0	0	0
Residential HVAC investment in 2020s vs.		4.8	4.71				
REF - Cumulative 5-yr (billion \$2018)							

Table 44: E+RE- scenario - PILLAR 1: Efficiency/Electrification - Commercial

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	2.22	28.1	70.4	83.7	85	85.1	85.1
Heat Pump (%)							
Sales of space heating units - Electric	2.54	8.39	10.6	12.7	13.1	13.1	13.1
Resistance (%)							
Sales of space heating units - Gas (%)	84.3	59.3	18.3	3.58	1.9	1.86	1.85
Sales of space heating units - Fossil (%)	11	4.19	0.8	0.034	0	0	0
Sales of water heating units - Electric	0.097	10.5	54.4	64.3	64.7	64.8	64.7
Heat Pump (%)							
Sales of water heating units - Electric	2.5	10.8	28.3	32.3	32.5	32.5	32.5
Resistance (%)							
Sales of water heating units - Gas (%)	93	74.5	14.3	0.646	0.003	0	0
Sales of water heating units - Other (%)	4.44	4.22	3.02	2.72	2.72	2.72	2.71
Sales of cooking units - Electric	32	46	79.9	86.5	86.9	86.9	86.9
Resistance (%)							
Sales of cooking units - Gas (%)	68	54	20.1	13.5	13.1	13.1	13.1
Commercial HVAC investment in 2020s -		21,776	24,347				
Cumulative 5-yr (million \$2018)							

Table 45: E+RE- scenario - PILLAR 2: Clean Electricity - Generating capacity

Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	2,851	1,599	0	0	0	0	0
Installed thermal - Natural gas (MW)	4,401	4,024	4,495	4,735	4,787	7,975	5,063
Installed thermal - Nuclear (MW)	1,829	1,829	1,829	2,228	2,228	5,292	6,619
Installed renewables - Rooftop PV (MW)	851	1,276	1,695	2,240	2,899	3,650	4,510
Installed renewables - Solar - Base land	569	1,405	2,106	2,586	2,865	2,865	2,865
use assumptions (MW)							
Installed renewables - Wind - Base land	191	191	191	191	191	191	191
use assumptions (MW)							
Installed renewables - Solar -	713	1,607	2,761	2,915	3,761	3,963	3,963
Constrained land use assumptions (MW)							
Installed renewables - Wind - Constrained	191	191	191	191	191	191	191
land use assumptions (MW)							
Installed renewables - Offshore Wind -	0	0	0	0	0	260	582
Constrained land use assumptions (MW)							
Capital invested - Solar PV - Base (billion		1.12	0.84	0.53	0.29	0	0
\$2018)							
Capital invested - Wind - Base (billion		0	0	0	0	0	0
\$2018)							
Capital invested - Solar PV - Constrained		1.2	1.38	0.17	0.879	0.198	0
(billion \$2018)							
Capital invested - Wind - Constrained		0	0	0	0	0	0
(billion \$2018)							

Table 45: E+RE- scenario - PILLAR 2: Clean Electricity - Generating capacity (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Capital invested - Offshore Wind -		0	0	0	0	0.383	0.427
Constrained (billion \$2018)							

Table 46: E+RE- scenario - PILLAR 2: Clean Electricity - Generation

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	1,078	2,619	3,931	4,822	5,347	5,347	5,347
Wind - Base land use assumptions (GWh)	786	786	786	786	786	786	786
OffshoreWind - Base land use assumptions (GWh)	0	0	0	0	0	0	0
Solar - Constrained land use assumptions (GWh)	1,345	3,008	5,115	5,408	6,969	7,338	7,338
Wind - Constrained land use assumptions (GWh)	786	786	786	786	786	786	786
OffshoreWind - Constrained land use assumptions (GWh)	0	0	0	0	0	1,098	2,486

Table 47: E+RE- scenario - PILLAR 6: Land sinks - Forests

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-18.8
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-183
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-511
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-71.1
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-288
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-125
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-31.1
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-67.1
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-184
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-1,480
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-28.2
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-642
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-922
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-104
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-576
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-240
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-46.6
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-477
pasture (1000 tCO2e/y)							
Carbon sink potential - Mid - Restore							-365
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - All (not				+			-3,401
counting overlap) (1000 tCO2e/y)							-,

Table 47: E+RE- scenario - PILLAR 6: Land sinks - Forests (continued)

Item Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - High - Accelerate							-37.6
regeneration (1000 tCO2e/y)							
Carbon sink potential - High - Avoid							-1,101
deforestation (1000 tCO2e/y)							
Carbon sink potential - High - Extend							-1,332
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-140
plantations (1000 tCO2e/y)							0//
Carbon sink potential - High - Increase retention of HWP (1000 tCO2e/y)							-864
Carbon sink potential - High - Increase							-356
trees outside forests (1000 tCO2e/y)							-330
Carbon sink potential - High - Reforest							-62.1
cropland (1000 tCO2e/y)							-02.1
Carbon sink potential - High - Reforest							-886
pasture (1000 tCO2e/y)							-000
Carbon sink potential - High - All (not							-5,324
counting overlap) (1000 tC02e/y)							0,024
Carbon sink potential - High - Restore							-546
productivity (1000 tCO2e/y)							0-10
Land impacted for carbon sink potential -							3.08
Low - Accelerate regeneration (1000							0.00
hectares)							
Land impacted for carbon sink potential -							140
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							260
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							25.8
Low - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							17.8
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							2.05
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							4.36
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							110
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							563
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							4.61
Mid - Accelerate regeneration (1000							
hectares)							1//
Land impacted for carbon sink potential -		[144
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							170
Land impacted for carbon sink potential -							470
Mid - Extend rotation length (1000							
hectares) Land impacted for carbon sink potential -							38.8
							აგ.გ
Mid - Improve plantations (1000 hectares)							

Table 47: E+RE- scenario - PILLAR 6: Land sinks - Forests (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							0
Mid - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							25.8
Mid - Increase trees outside forests (1000							
hectares)							
Land impacted for carbon sink potential -							3.08
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							31.5
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							221
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							938
Mid - Total impacted (over 30 years) (1000							
hectares)							
Land impacted for carbon sink potential -							6.15
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							149
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							679
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							51.5
High - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
High - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							33.8
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							4.11
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							25.2
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							181
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							1,130
High - Total impacted (over 30 years)							.,
(1000 hectares)							

Table 48: E+RE- scenario - PILLAR 6: Land sinks - Agriculture

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-313
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-14.5
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							-327
deployment - Total (1000 tCO2e/y)							

Table 48: E+RE- scenario - PILLAR 6: Land sinks - Agriculture (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive							0
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-595
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Aggressive							-29
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Aggressive							-624
deployment - Total (1000 tCO2e/y)							
Land impacted for carbon sink - Moderate							0
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							276
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							26.4
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							302
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							0
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							525
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							52.7
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							578
Aggressive deployment - Total (1000							
hectares)							

Table 49: E-B+ scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		83.9	0.057	0.056	0.052	0.036	0.003
Fuel Comb - Electric Generation - Coal							
(deaths)							
Premature deaths from air pollution -		27.2	16.8	9.67	7.59	4.48	1.32
Fuel Comb - Electric Generation - Natural							
Gas (deaths)							
Premature deaths from air pollution -		251	254	247	222	176	120
Mobile - On-Road (deaths)							
Premature deaths from air pollution - Gas		18	18.2	17.5	15.7	12.4	8.42
Stations (deaths)							
Premature deaths from air pollution -		32.5	29.9	26.4	21.5	15.7	10.2
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		16.3	15.7	15.2	13.3	9.81	6.08
Fuel Comb - Residential - Oil (deaths)							
Premature deaths from air pollution -		4.25	4.29	4.26	3.91	3.16	2.31
Fuel Comb - Residential - Other (deaths)							
Premature deaths from air pollution -		1.88	1.8	1.72	1.63	1.54	1.44
Fuel Comb - Comm/Institutional - Coal							
(deaths)							
Premature deaths from air pollution -		35.3	34.5	32.7	28.5	22.4	16.2
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							

Table 49: E-B+ scenario - IMPACTS - Health (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Oil (deaths)		9.21	7.97	6.74	5.46	4.39	3.48
Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Other (deaths)		2.59	2.37	2.14	1.9	1.67	1.43
Premature deaths from air pollution - Industrial Processes - Coal Mining (deaths)		1.17	0.673	0.674	0.67	0.679	0.669
Premature deaths from air pollution - Industrial Processes - Oil & Gas Production (deaths)		53.9	46.5	37.2	30.2	25.2	18.2
Monetary damages from air pollution - Fuel Comb - Electric Generation - Coal (million \$2019)		744	0.505	0.5	0.458	0.318	0.027
Monetary damages from air pollution - Fuel Comb - Electric Generation - Natural Gas (million \$2019)		241	149	85.6	67.2	39.7	11.7
Monetary damages from air pollution - Mobile - On-Road (million \$2019)		2,231	2,262	2,199	1,975	1,567	1,069
Monetary damages from air pollution - Gas Stations (million \$2019)		159	161	155	139	109	74.6
Monetary damages from air pollution - Fuel Comb - Residential - Natural Gas (million \$2019)		288	265	234	191	139	90
Monetary damages from air pollution - Fuel Comb - Residential - Oil (million \$2019)		144	140	134	117	86.9	53.8
Monetary damages from air pollution - Fuel Comb - Residential - Other (million \$2019)		37.6	38	37.7	34.7	28	20.5
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Coal (million \$2019)		16.6	15.9	15.2	14.4	13.6	12.7
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Natural Gas (million \$2019)		312	306	289	252	198	143
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Oil (million \$2019)		81.5	70.5	59.6	48.3	38.8	30.8
Monetary damages from air pollution - Fuel Comb - Comm/Institutional - Other (million \$2019)		23	21	19	16.8	14.7	12.7
Monetary damages from air pollution - Industrial Processes - Coal Mining (million \$2019)		10.3	5.94	5.95	5.91	5.99	5.9
Monetary damages from air pollution - Industrial Processes - Oil & Gas Production (million \$2019)		478	413	330	268	224	162

Table 50: E-B+ scenario - IMPACTS - Jobs

Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		55.5	77.8	29.1	21.5	17.8	388
By economic sector - Construction (jobs)		8,248	7,111	7,691	7,257	8,995	16,520
By economic sector - Manufacturing		2,013	2,792	2,240	1,932	2,707	4,481
(jobs)							
By economic sector - Mining (jobs)		1,395	962	708	524	337	175
By economic sector - Other (jobs)		1,213	1,081	1,171	1,229	1,503	2,554
By economic sector - Pipeline (jobs)		303	252	351	193	155	163
By economic sector - Professional (jobs)		3,421	3,025	3,115	3,242	4,016	7,638

Table 50: E-B+ scenario - IMPACTS - Jobs (continued)

Table 66. E B. Section 16 1711 71676 6686	Continucaj						
Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Trade (jobs)		2,541	2,173	2,223	2,276	2,718	4,760
By economic sector - Utilities (jobs)		5,772	5,433	6,401	6,461	9,070	18,743
By resource sector - Biomass (jobs)		221	209	98.4	90.2	82.6	1,830
By resource sector - CO2 (jobs)		0	0	1,152	98.6	127	574
By resource sector - Coal (jobs)		803	212	0	0	0	0
By resource sector - Grid (jobs)		6,934	7,418	8,848	9,674	15,607	35,778
By resource sector - Natural Gas (jobs)		3,220	2,382	1,996	2,268	1,809	1,563
By resource sector - Nuclear (jobs)		923	908	894	880	866	853
By resource sector - Oil (jobs)		3,110	2,602	2,182	1,830	1,319	734
By resource sector - Solar (jobs)		9,419	8,488	7,952	7,331	8,056	11,921
By resource sector - Wind (jobs)		331	687	807	966	1,652	2,171
By education level - All sectors - High		10,624	9,763	10,200	9,792	12,530	23,699
school diploma or less (jobs)							
By education level - All sectors -		7,899	7,263	7,686	7,439	9,573	17,989
Associates degree or some college (jobs)							
By education level - All sectors -		5,018	4,596	4,717	4,591	5,771	10,671
Bachelors degree (jobs)							
By education level - All sectors - Masters		1,235	1,122	1,162	1,148	1,445	2,699
or professional degree (jobs)							
By education level - All sectors - Doctoral		185	163	166	166	200	365
degree (jobs)							
Related work experience - All sectors -		3,620	3,323	3,499	3,385	4,331	8,187
None (jobs)							
Related work experience - All sectors - Up		5,033	4,632	4,795	4,621	5,889	11,102
to 1 year (jobs)							
Related work experience - All sectors - 1		8,972	8,221	8,589	8,320	10,608	19,891
to 4 years (jobs)							
Related work experience - All sectors - 4		5,829	5,332	5,597	5,411	6,900	12,907
to 10 years (jobs)							
Related work experience - All sectors -		1,506	1,399	1,450	1,399	1,790	3,336
Over 10 years (jobs)							
On-the-Job Training - All sectors - None		1,392	1,265	1,305	1,263	1,582	2,917
(jobs)							
On-the-Job Training - All sectors - Up to 1		16,185	14,936	15,473	14,974	19,098	35,896
year (jobs)							
On-the-Job Training - All sectors - 1 to 4		5,340	4,879	5,178	4,996	6,413	12,049
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		1,796	1,599	1,741	1,683	2,153	4,072
years (jobs)							
On-the-Job Training - All sectors - Over 10		248	228	233	220	273	489
years (jobs)							
On-Site or In-Plant Training - All sectors -		4,058	3,723	3,857	3,726	4,714	8,760
None (jobs)							
On-Site or In-Plant Training - All sectors -		14,742	13,587	14,109	13,653	17,430	32,781
Up to 1 year (jobs)							
On-Site or In-Plant Training - All sectors -		4,133	3,782	4,002	3,861	4,955	9,314
1 to 4 years (jobs)							
On-Site or In-Plant Training - All sectors -		1,812	1,616	1,749	1,688	2,151	4,055
4 to 10 years (jobs)							
On-Site or In-Plant Training - All sectors -		216	198	214	207	269	514
Over 10 years (jobs)		4 / / 0	1.00=	4 .4=	4.000	4.004	0 / 00
Wage income - All (million \$2019)		1,442	1,337	1,417	1,392	1,801	3,433

Table 51: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Overview

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	449	421	386	356	331	302	268
Final energy use - Residential (PJ)	241	229	222	214	200	183	167
Final energy use - Commercial (PJ)	189	189	186	183	177	171	167
Final energy use - Industry (PJ)	130	132	133	143	154	162	170

Table 52: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		2.54	2.53	3.68	3.81	5.55	5.88
Cumulative 5-yr (billion \$2018)							

Table 53: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Transportation

Item	2020	2025	2030	2035	2040	2045	2050
Vehicle stocks - LDV – EV (1000 units)	50.7	151	250	713	1,176	2,200	3,224
Vehicle stocks - LDV – All others (1000 units)	4,214	4,214	4,214	3,998	3,781	2,914	2,046
Light-duty vehicle capital costs vs. REF - Cumulative 5-yr (million \$2018)		0	133	271	925	2,883	4,210
Public EV charging plugs - DC Fast (1000 units)	0.402		0.44		2.06		5.66
Public EV charging plugs - L2 (1000 units)	1.67		10.6		49.6		136

Table 54: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Residential

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	17.4	27.2	32.2	46.7	68.8	83.3	88.3
Heat Pump (%)							
Sales of space heating units - Electric	13.2	15.3	14.3	11.6	7.67	5.11	4.2
Resistance (%)							
Sales of space heating units - Gas (%)	55.1	36	33.4	26	14.6	7.13	4.52
Sales of space heating units - Fossil (%)	14.3	21.5	20.1	15.7	8.92	4.46	2.92
Sales of water heating units - Electric	0	1.58	6.08	19	38.9	51.9	56.4
Heat Pump (%)							
Sales of water heating units - Electric	35.7	52.7	51.6	48.7	44.3	41.5	40.5
Resistance (%)							
Sales of water heating units - Gas Furnace	59.5	42.2	38.9	29.2	14.4	4.62	1.21
(%)							
Sales of water heating units - Other (%)	4.77	3.53	3.4	3	2.4	2.02	1.89
Sales of cooking units - Electric	59	60.1	63.8	73.7	87.5	96	98.9
Resistance (%)							
Sales of cooking units - Gas (%)	41	39.9	36.2	26.3	12.5	4.04	1.09
Residential HVAC investment in 2020s vs.		4.8	4.72				
REF - Cumulative 5-yr (billion \$2018)							

Table 55: E-B+ scenario - PILLAR 1: Efficiency/Electrification - Commercial

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	2.22	20.1	24.9	38.9	61	76.7	82.8
Heat Pump (%)							
Sales of space heating units - Electric	2.54	8.05	8.31	9.13	10.6	12	12.8
Resistance (%)							
Sales of space heating units - Gas (%)	84.3	67	62.3	48.5	26.7	10.8	4.34
Sales of space heating units - Fossil (%)	11	4.85	4.51	3.43	1.69	0.531	0.139
Sales of water heating units - Electric	0.097	2.03	7.02	21.4	43.5	57.9	63
Heat Pump (%)							
Sales of water heating units - Electric	2.5	7.39	9.34	15.1	24	29.8	31.8
Resistance (%)							
Sales of water heating units - Gas (%)	93	86.1	79.2	59.6	29.2	9.38	2.45
Sales of water heating units - Other (%)	4.44	4.46	4.4	3.91	3.31	2.91	2.76
Sales of cooking units - Electric	32	36.2	40.9	53.4	71	81.7	85.5
Resistance (%)							
Sales of cooking units - Gas (%)	68	63.8	59.1	46.6	29	18.3	14.5
Commercial HVAC investment in 2020s -		21,752	24,163				
Cumulative 5-yr (million \$2018)							

Table 56: E-B+ scenario - PILLAR 2: Clean Electricity - Generating capacity

Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	2,851	1,599	0	0	0	0	0
Installed thermal - Natural gas (MW)	4,401	6,754	6,754	6,754	8,019	8,691	8,525
Installed thermal - Nuclear (MW)	1,829	1,829	1,829	1,829	1,829	1,829	1,829
Capital invested - Biomass power plant (billion \$2018)	0	0	0	0	0	0	0
Capital invested - Biomass w/ccu allam power plant (billion \$2018)	0	0	0	0	0	0	0
Capital invested - Biomass w/ccu power plant (billion \$2018)	0	0	0	0	0	0	0

Table 57: E-B+ scenario - PILLAR 2: Clean Electricity - Generation

Item	2020	2025	2030	2035	2040	2045	2050
Biomass power plant (GWh)	0	0	0	0	0	0	0
Biomass w/ccu power plant (GWh)	0	0	0	0	0	0	0
Biomass w/ccu allam power plant (GWh)	0	0	0	0	0	0	0

Table 58: E-B+ scenario - PILLAR 3: Clean fuels - Bioenergy

Item	2020	2025	2030	2035	2040	2045	2050
Number of facilities - Power (quantity)	0	0	0	0	0	0	0
Number of facilities - Power ccu	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Allam power w ccu	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Beccs hydrogen	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Diesel (quantity)	0	0	0	0	0	0	0
Number of facilities - Diesel ccu (quantity)	0	0	0	0	0	0	0
Number of facilities - Pyrolysis (quantity)	0	0	0	0	0	0	6
Number of facilities - Pyrolysis ccu	0	0	0	0	0	0	0
(quantity)							
Number of facilities - Sng (quantity)	0	0	0	0	0	0	0
Number of facilities - Sng ccu (quantity)	0	0	0	0	0	0	0
Conversion capital investment -		0	0	0	0	0	5,252
Cumulative 5-yr (million \$2018)							
Biomass purchases (million \$2018/y)		0	0	0	0	0	476

Table 59: E-B+ scenario - PILLAR 4: CCUS - CO2 capture

Item	2020	2025	2030	2035	2040	2045	2050
Annual - All (MMT)		0	0	0	3.32	3.42	3.53
Annual - BECCS (MMT)		0	0	0	0	0	0
Annual - NGCC (MMT)		0	0	0	0	0	0
Annual - Cement and lime (MMT)		0	0	0	3.32	3.42	3.53
Cumulative - All (MMT)		0	0	0	3.32	6.74	10.3
Cumulative - BECCS (MMT)		0	0	0	0	0	0
Cumulative - NGCC (MMT)		0	0	0	0	0	0
Cumulative - Cement and lime (MMT)		0	0	0	3.32	6.74	10.3

Table 60: E-B+ scenario - PILLAR 4: CCUS - CO2 pipelines

Item	2020	2025	2030	2035	2040	2045	2050
Trunk (km)		0	0	112	112	112	112
Spur (km)		0	0	0	85.1	85.1	145
All (km)		0	0	112	197	197	257
Cumulative investment - Trunk (million \$2018)		0	0	667	667	667	667
Cumulative investment - Spur (million \$2018)		0	0	0	81.3	82.7	153

Table 60: E-B+ scenario - PILLAR 4: CCUS - CO2 pipelines (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Cumulative investment - All (million		0	0	667	748	749	820
\$2018)							

Table 61: E-B+ scenario - PILLAR 4: CCUS - CO2 storage

Item	2020	2025	2030	2035	2040	2045	2050
Annual (MMT)		0	0	0	0	0	0
Injection wells (wells)		0	0	0	0	0	0
Resource characterization, appraisal, permitting costs (million \$2020)		0	0	0	0	0	0
Wells and facilities construction costs (million \$2020)		0	0	0	0	0	0

Table 62: E-B+ scenario - PILLAR 6: Land sinks - Forests

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-18.8
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-183
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-511
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-71.1
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-288
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-125
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-31.1
cropland (1000 tCO2e/y)							
Carbon sink potential - Low - Reforest							-67.1
pasture (1000 tCO2e/y)							
Carbon sink potential - Low - Restore							-184
productivity (1000 tCO2e/y)							
Carbon sink potential - Low - All (not							-1,480
counting overlap) (1000 tCO2e/y)							
Carbon sink potential - Mid - Accelerate							-28.2
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-642
deforestation (1000 tCO2e/y)							
Carbon sink potential - Mid - Extend							-922
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-104
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-576
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-240
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-46.6
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-477
pasture (1000 tC02e/y)							
Carbon sink potential - Mid - Restore							-365
productivity (1000 tCO2e/y)							
Carbon sink potential - Mid - All (not							-3,401
counting overlap) (1000 tCO2e/y)							•
Carbon sink potential - High - Accelerate		+	+				-37.6
regeneration (1000 tC02e/y)							00
Carbon sink potential - High - Avoid			+				-1,101
deforestation (1000 tC02e/y)							.,.51

Table 62: E-B+ scenario - PILLAR 6: Land sinks - Forests (continued)

Them	2020	2025	2030	2025	2040	207.5	2050
Item Carbon sink potential - High - Extend	2020	2025	2030	2035	2040	2045	-1,332
rotation length (1000 tC02e/y)							-1,002
Carbon sink potential - High - Improve							-140
plantations (1000 tCO2e/y)							-140
Carbon sink potential - High - Increase							-864
retention of HWP (1000 tCO2e/y)							-004
Carbon sink potential - High - Increase							-356
·							-330
trees outside forests (1000 tC02e/y)							/01
Carbon sink potential - High - Reforest							-62.1
cropland (1000 tC02e/y)							007
Carbon sink potential - High - Reforest							-886
pasture (1000 tC02e/y)							
Carbon sink potential - High - All (not							-5,324
counting overlap) (1000 tC02e/y)							
Carbon sink potential - High - Restore							-546
productivity (1000 tCO2e/y)							
Land impacted for carbon sink potential -							3.08
Low - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							140
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							260
Low - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							25.8
Low - Improve plantations (1000							20.0
hectares)							
Land impacted for carbon sink potential -							0
Low - Increase retention of HWP (1000							U
-							
hectares)							17.0
Land impacted for carbon sink potential -							17.8
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							2.05
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							4.36
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							110
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							563
Low - Total impacted (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							4.61
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							144
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							470
							410
Mid - Extend rotation length (1000							
hectares)							00.0
Land impacted for carbon sink potential -							38.8
Mid - Improve plantations (1000 hectares)							
Land impacted for carbon sink potential -							0
Mid - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							25.8
Mid - Increase trees outside forests (1000							
hectares)							
-							

Table 62: E-B+ scenario - PILLAR 6: Land sinks - Forests (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							3.08
Mid - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							31.5
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							221
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							938
Mid - Total impacted (over 30 years) (1000							
hectares)							
Land impacted for carbon sink potential -							6.15
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							149
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							679
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							51.5
High - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							0
High - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							33.8
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							4.11
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							25.2
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							181
High - Restore productivity (1000							-
hectares)							
Land impacted for carbon sink potential -							1,130
High - Total impacted (over 30 years)							.,.50
(1000 hectares)							

Table 63: E-B+ scenario - PILLAR 6: Land sinks - Agriculture

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Moderate							-140
deployment - Corn-ethanol to energy							
grasses (1000 tCO2e/y)							
Carbon sink potential - Moderate							-276
deployment - Cropland measures (1000							
tCO2e/y)							
Carbon sink potential - Moderate							-12.6
deployment - Permanent conservation							
cover (1000 tCO2e/y)							
Carbon sink potential - Moderate							0
deployment - Cropland to woody energy							
crops (1000 tC02e/y)							
Carbon sink potential - Moderate							0
deployment - Pasture to energy crops							
(1000 tC02e/y)							
Carbon sink potential - Moderate							-429
deployment - Total (1000 tCO2e/y)							

Table 63: E-B+ scenario - PILLAR 6: Land sinks - Agriculture (continued)

Table 63: E-B+ scenario - PILLAR 6: Land 3 Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Aggressive	2020	2023	2030	2000	2040	2043	-140
deployment - Corn-ethanol to energy							140
grasses (1000 tC02e/y)							
Carbon sink potential - Aggressive							-526
deployment - Cropland measures (1000							-320
tCO2e/y)							
Carbon sink potential - Aggressive							-25.2
deployment - Permanent conservation							-20.2
cover (1000 tC02e/y)							
Carbon sink potential - Aggressive							0
deployment - Cropland to woody energy							U
crops (1000 tCO2e/y)							
Carbon sink potential - Aggressive							0
							U
deployment - Pasture to energy crops							
(1000 tC02e/y)							(01
Carbon sink potential - Aggressive							-691
deployment - Total (1000 tC02e/y)							
Land impacted for carbon sink - Moderate							66.5
deployment - Corn-ethanol to energy							
grasses (1000 hectares)							
Land impacted for carbon sink - Moderate							243
deployment - Cropland measures (1000							
hectares)							
Land impacted for carbon sink - Moderate							22.9
deployment - Permanent conservation							
cover (1000 hectares)							
Land impacted for carbon sink - Moderate							24.8
deployment - Cropland to woody energy							
crops (1000 hectares)							
Land impacted for carbon sink - Moderate							15.5
deployment - Pasture to energy crops							
(1000 hectares)							
Land impacted for carbon sink - Moderate							372
deployment - Total (1000 hectares)							
Land impacted for carbon sink -							66.5
Aggressive deployment - Corn-ethanol to							
energy grasses (1000 hectares)							
Land impacted for carbon sink -							1,142
Aggressive deployment - Cropland							
measures (1000 hectares)							
Land impacted for carbon sink -							45.8
Aggressive deployment - Permanent							
conservation cover (1000 hectares)							
Land impacted for carbon sink -							24.8
Aggressive deployment - Cropland to							
woody energy crops (1000 hectares)							
Land impacted for carbon sink -							15.5
Aggressive deployment - Pasture to							10.0
energy crops (1000 hectares)							
Land impacted for carbon sink -							1,295
Aggressive deployment - Total (1000							1,270
hectares)							
nootal 60)							

Table 64: REF scenario - IMPACTS - Health

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution - Fuel Comb - Electric Generation - Coal (deaths)		219	138	129	125	123	113

Table 64: REF scenario - IMPACTS - Health (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Premature deaths from air pollution -		22.4	24.9	29.7	31.3	28.6	27.7
Fuel Comb - Electric Generation - Natural							
Gas (deaths) Premature deaths from air pollution -		250	257	263	270	277	283
Mobile - On-Road (deaths)		250	251	203	210	211	203
Premature deaths from air pollution - Gas		17.9	18.3	18.6	19.1	19.5	19.8
Stations (deaths)			.5.5	.0.0			
Premature deaths from air pollution -		32	29.9	28.6	28.2	28.4	28.5
Fuel Comb - Residential - Natural Gas							
(deaths)							
Premature deaths from air pollution -		15.5	13	9.13	5.83	3.47	2.18
Fuel Comb - Residential - Oil (deaths)		/ 07	. 0/	/ 0/	/ 15	1.01	4.32
Premature deaths from air pollution - Fuel Comb - Residential - Other (deaths)		4.07	4.04	4.06	4.15	4.24	4.32
Premature deaths from air pollution -		1.96	1.97	1.97	1.97	1.96	1.94
Fuel Comb - Comm/Institutional - Coal		1.70	1.21	1.71	1.21	1.70	1.74
(deaths)							
Premature deaths from air pollution -		35.6	35.1	32.9	30.3	29.4	30.4
Fuel Comb - Comm/Institutional - Natural							
Gas (deaths)							
Premature deaths from air pollution -		9.39	8.57	7.62	6.65	6.11	5.85
Fuel Comb - Comm/Institutional - Oil							
(deaths)		0.71	0.01	0.01	0	0.00	0.1/
Premature deaths from air pollution - Fuel Comb - Comm/Institutional - Other		2.71	2.81	2.91	3	3.08	3.16
(deaths)							
Premature deaths from air pollution -		2.1	1.57	1.34	1.29	1.27	1.21
Industrial Processes - Coal Mining		2	1.01	1.04	1.27	1.21	1.21
(deaths)							
Premature deaths from air pollution -		54.3	58.7	61	58.3	58.6	56.5
Industrial Processes - Oil & Gas							
Production (deaths)							
Monetary damages from air pollution -		1,940	1,219	1,141	1,109	1,088	998
Fuel Comb - Electric Generation - Coal							
(million \$2019) Monetary damages from air pollution -	+	199	221	263	277	254	246
Fuel Comb - Electric Generation - Natural		199	221	203	211	254	240
Gas (million \$2019)							
Monetary damages from air pollution -		2,223	2,284	2,337	2,400	2,459	2,517
Mobile - On-Road (million \$2019)		.	,			,	,
Monetary damages from air pollution -		158	162	165	169	173	176
Gas Stations (million \$2019)							
Monetary damages from air pollution -		284	265	253	249	252	253
Fuel Comb - Residential - Natural Gas							
(million \$2019)		107	115	00.0	E1 7	20.7	19.3
Monetary damages from air pollution - Fuel Comb - Residential - Oil (million		137	115	80.9	51.7	30.7	19.3
\$2019)							
Monetary damages from air pollution -		36	35.8	36	36.7	37.6	38.3
Fuel Comb - Residential - Other (million			33.3		00	00	00.0
\$2019)							
Monetary damages from air pollution -		17.4	17.4	17.5	17.4	17.4	17.2
Fuel Comb - Comm/Institutional - Coal							
(million \$2019)							
Monetary damages from air pollution -		315	311	291	269	260	269
Fuel Comb - Comm/Institutional - Natural							
Gas (million \$2019) Monetary damages from air pollution -		83.1	75.9	67.5	58.8	54.1	51.8
Fuel Comb - Comm/Institutional - Oil		03.1	75.9	01.0	36.6	54.1	31.8
Filel ('0mh - ('0mm/Institutional - Oil							

Table 64: REF scenario - IMPACTS - Health (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Monetary damages from air pollution -		24	24.9	25.8	26.5	27.3	28
Fuel Comb - Comm/Institutional - Other							
(million \$2019)							
Monetary damages from air pollution -		18.6	13.8	11.8	11.4	11.2	10.6
Industrial Processes - Coal Mining							
(million \$2019)							
Monetary damages from air pollution -		482	521	542	518	521	502
Industrial Processes - Oil & Gas							
Production (million \$2019)							

Table 65: REE scenario - IMPACTS - Johs

Table 65: REF scenario - IMPACTS - Jobs							
Item	2020	2025	2030	2035	2040	2045	2050
By economic sector - Agriculture (jobs)		52.7	47.2	46.7	38	37.9	41.1
By economic sector - Construction (jobs)		2,968	4,758	5,552	6,175	6,438	8,253
By economic sector - Manufacturing (jobs)		1,220	1,240	1,342	1,479	1,488	1,874
By economic sector - Mining (jobs)		1,413	1,143	932	761	646	512
By economic sector - Other (jobs)		144	562	718	866	970	1,690
By economic sector - Pipeline (jobs)		311	320	323	306	310	309
By economic sector - Professional (jobs)		1,620	2,112	2,394	2,685	2,805	3,706
By economic sector - Trade (jobs)		1,360	1,652	1,788	1,964	2,060	2,776
By economic sector - Utilities (jobs)		5,009	4,901	5,661	6,336	6,547	6,736
By resource sector - Biomass (jobs)		203	190	177	158	162	164
By resource sector - CO2 (jobs)		0	0	0	0	0	0
By resource sector - Coal (jobs)		803	598	567	539	514	197
By resource sector - Grid (jobs)		5,499	5,656	7,418	8,683	9,315	10,024
By resource sector - Natural Gas (jobs)		3,363	3,132	3,254	3,696	3,527	3,338
By resource sector - Nuclear (jobs)		923	908	710	438	431	425
By resource sector - Oil (jobs)		3,128	2,658	2,331	2,159	2,061	1,993
By resource sector - Solar (jobs)			3,365	4,054	4,605	4,941	9,091
By resource sector - Wind (jobs)		179	229	246	331	351	664
By education level - All sectors - High		5,784	7,030	7,924	8,716	9,023	10,987
school diploma or less (jobs)		/ / 00	F 000	F 000	(((7	/ 005	0.001
By education level - All sectors -		4,403	5,280	5,990	6,647	6,885	8,381
Associates degree or some college (jobs) By education level - All sectors -		3,066	3,457	3,779	4,092	4,204	5,071
Bachelors degree (jobs)		3,000	3,451	3,119	4,092	4,204	5,071
By education level - All sectors - Masters		746	849	933	1,014	1,045	1,273
or professional degree (jobs)		140	047	700	1,014	1,040	1,210
By education level - All sectors - Doctoral		99	120	130	141	145	185
degree (jobs)							
Related work experience - All sectors -		2,041	2,433	2,745	3,033	3,141	3,824
None (jobs)							
Related work experience - All sectors - Up		2,648	3,269	3,674	4,034	4,178	5,171
to 1 year (jobs)							
Related work experience - All sectors - 1		5,175	6,072	6,786	7,448	7,695	9,318
to 4 years (jobs)							
Related work experience - All sectors - 4		3,350	3,938	4,411	4,850	5,005	6,041
to 10 years (jobs)							
Related work experience - All sectors -		884	1,024	1,139	1,245	1,283	1,543
Over 10 years (jobs)							
On-the-Job Training - All sectors - None (jobs)		755	914	1,011	1,100	1,137	1,416
On-the-Job Training - All sectors - Up to 1		9,267	10,891	12,149	13,310	13,751	16,724
year (jobs)							
On-the-Job Training - All sectors - 1 to 4		2,997	3,585	4,057	4,487	4,641	5,602
years (jobs)							
On-the-Job Training - All sectors - 4 to 10		955	1,189	1,365	1,523	1,579	1,912
years (jobs)							

				_
Tabla 45.	RFF scenario -	IMDMCTC	Inhel	(nontinued)
Taure on	KEE SURIUU III -	IIVIPALII -	. 11 11 15 1	

Item	2020	2025	2030	2035	2040	2045	2050
On-the-Job Training - All sectors - Over 10 years (jobs)		124	157	174	189	195	243
On-Site or In-Plant Training - All sectors - None (jobs)		2,230	2,680	2,988	3,275	3,382	4,166
On-Site or In-Plant Training - All sectors - Up to 1 year (jobs)		8,441	9,928	11,087	12,153	12,558	15,254
On-Site or In-Plant Training - All sectors - 1 to 4 years (jobs)		2,317	2,772	3,134	3,463	3,582	4,331
On-Site or In-Plant Training - All sectors - 4 to 10 years (jobs)		990	1,211	1,379	1,532	1,586	1,911
On-Site or In-Plant Training - All sectors - Over 10 years (jobs)		121	145	168	188	195	235
Wage income - All (million \$2019)		849	997	1,127	1,251	1,308	1,592

Table 66: REF scenario - PILLAR 1: Efficiency/Electrification - Overview

Item	2020	2025	2030	2035	2040	2045	2050
Final energy use - Transportation (PJ)	449	422	391	372	373	384	398
Final energy use - Residential (PJ)	241	228	225	225	227	233	239
Final energy use - Commercial (PJ)	189	191	193	193	194	199	210
Final energy use - Industry (PJ)	130	136	143	150	159	169	180

Table 67: REF scenario - PILLAR 1: Efficiency/Electrification - Electricity demand

Item	2020	2025	2030	2035	2040	2045	2050
Electricity distribution capital invested -		2.72	2.74	4.82	5.09	5.1	5.33
Cumulative 5-yr (billion \$2018)							

Table 68: REF scenario - PILLAR 1: Efficiency/Electrification - Residential

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	15	40.3	41.5	42.8	43.7	44.6	45.9
Heat Pump (%)							
Sales of space heating units - Electric	13.7	12.7	12.4	12	11.7	10.8	9.45
Resistance (%)							
Sales of space heating units - Gas (%)	56.6	31	38.4	41.1	40.8	40.8	40.9
Sales of space heating units - Fossil (%)	14.7	16.1	7.71	4.03	3.79	3.76	3.81
Sales of water heating units - Electric	0	0	0	0	0	0	0
Heat Pump (%)							
Sales of water heating units - Electric	35.7	53	53	52.9	52.9	52.8	52.8
Resistance (%)							
Sales of water heating units - Gas Furnace	59.5	43.4	43.4	43.5	43.5	43.6	43.6
(%)							
Sales of water heating units - Other (%)	4.77	3.57	3.58	3.59	3.6	3.6	3.61
Sales of cooking units - Electric	58.7	58.7	58.7	58.7	58.7	58.7	58.7
Resistance (%)							
Sales of cooking units - Gas (%)	41.3	41.3	41.3	41.3	41.3	41.3	41.3
Residential HVAC investment in 2020s vs.		4.7	4.34				
REF - Cumulative 5-yr (billion \$2018)							

Table 69: REF scenario - PILLAR 1: Efficiency/Electrification - Commercial

Item	2020	2025	2030	2035	2040	2045	2050
Sales of space heating units - Electric	2.22	24.1	48.5	68.5	71.8	72.2	72.1
Heat Pump (%)							
Sales of space heating units - Electric	2.54	8.78	12.8	20.1	25.2	25.9	26
Resistance (%)							
Sales of space heating units - Gas (%)	84.3	62.4	35.2	9.92	2.85	1.92	1.85
Sales of space heating units - Fossil (%)	11	4.72	3.48	1.49	0.219	0.018	0

		_
Tahla 60: DEE congrin.	DILLAR 1. Efficiency/Electrification	- Commercial (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Sales of water heating units - Electric	0.097	0.269	0.266	0.268	0.269	0.268	0.269
Heat Pump (%)							
Sales of water heating units - Electric	2.5	6.69	6.63	6.64	6.67	6.65	6.66
Resistance (%)							
Sales of water heating units - Gas (%)	93	88.5	88.5	88.6	88.5	88.5	88.6
Sales of water heating units - Other (%)	4.44	4.5	4.6	4.5	4.54	4.55	4.51
Sales of cooking units - Electric	32	34.3	34.3	34.3	34.4	34.3	34.3
Resistance (%)							
Sales of cooking units - Gas (%)	68	65.7	65.7	65.7	65.6	65.7	65.7
Commercial HVAC investment in 2020s -		21,455	22,311				
Cumulative 5-yr (million \$2018)							

Table 70: REF scenario - PILLAR 2: Clean Electricity - Generating capacity

Item	2020	2025	2030	2035	2040	2045	2050
Installed thermal - Coal (MW)	2,851	1,599	1,599	1,599	1,599	1,599	0
Installed thermal - Natural gas (MW)	4,401	7,065	7,065	7,582	9,862	11,289	11,129
Installed thermal - Nuclear (MW)	1,829	1,829	1,829	911	911	911	911
Installed renewables - Rooftop PV (MW)	851	1,276	1,695	2,240	2,899	3,650	4,510
Installed renewables - Solar - Base land	389	389	389	389	389	389	389
use assumptions (MW)							
Installed renewables - Wind - Base land	191	191	191	191	191	191	191
use assumptions (MW)							
Installed renewables - Offshore Wind -	0	0	0	0	0	0	1,551
Base land use assumptions (MW)							
Installed renewables - Solar -	4.27	4.27	4.27	4.27	4.27	4.27	4.27
Constrained land use assumptions (MW)							

Table 71: REF scenario - PILLAR 2: Clean Electricity - Generation

Item	2020	2025	2030	2035	2040	2045	2050
Solar - Base land use assumptions (GWh)	758	758	758	758	758	758	758
Wind - Base land use assumptions (GWh)	786	786	786	786	786	786	786
OffshoreWind - Base land use	0	0	0	0	0	0	0
assumptions (GWh)							

Table 72: REF scenario - PILLAR 6: Land sinks - Forests - REF only

Item	2020	2025	2030	2035	2040	2045	2050
Business-as-usual carbon sink - Natural uptake (Mt CO2e/y)	-4.41		-2.14				-1.92
Business-as-usual carbon sink - Retained in Hardwood Products (Mt CO2e/y)	-0.235		-0.423				-0.44
Business-as-usual carbon sink - Total (Mt CO2e/y)	-4.65		-2.57				-2.36

Table 73: REF scenario - PILLAR 6: Land sinks - Forests

Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Accelerate							-18.8
regeneration (1000 tCO2e/y)							
Carbon sink potential - Low - Avoid							-183
deforestation (1000 tCO2e/y)							
Carbon sink potential - Low - Extend							-511
rotation length (1000 tCO2e/y)							
Carbon sink potential - Low - Improve							-71.1
plantations (1000 tCO2e/y)							
Carbon sink potential - Low - Increase							-288
retention of HWP (1000 tCO2e/y)							

Table 73: REF scenario - PILLAR 6: Land sinks - Forests (continued)

lable 73: REF scenario - PILLAR 6: Land sir		_ `		0005	0010	00/5	0050
Item	2020	2025	2030	2035	2040	2045	2050
Carbon sink potential - Low - Increase							-125
trees outside forests (1000 tC02e/y)							011
Carbon sink potential - Low - Reforest							-31.1
cropland (1000 tC02e/y)							/71
Carbon sink potential - Low - Reforest							-67.1
pasture (1000 tC02e/y)							10/
Carbon sink potential - Low - Restore							-184
productivity (1000 tC02e/y)							4 / 00
Carbon sink potential - Low - All (not							-1,480
counting overlap) (1000 tC02e/y)							
Carbon sink potential - Mid - Accelerate							-28.2
regeneration (1000 tCO2e/y)							
Carbon sink potential - Mid - Avoid							-642
deforestation (1000 tC02e/y)							
Carbon sink potential - Mid - Extend							-922
rotation length (1000 tCO2e/y)							
Carbon sink potential - Mid - Improve							-104
plantations (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-576
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - Mid - Increase							-240
trees outside forests (1000 tC02e/y)							
Carbon sink potential - Mid - Reforest							-46.6
cropland (1000 tCO2e/y)							
Carbon sink potential - Mid - Reforest							-477
pasture (1000 tC02e/y)							
Carbon sink potential - Mid - Restore							-365
productivity (1000 tC02e/y)							505
Carbon sink potential - Mid - All (not							-3,401
counting overlap) (1000 tC02e/y)							-3,401
							-37.6
Carbon sink potential - High - Accelerate							-31.0
regeneration (1000 tC02e/y)							1 101
Carbon sink potential - High - Avoid							-1,101
deforestation (1000 tC02e/y)							
Carbon sink potential - High - Extend							-1,332
rotation length (1000 tCO2e/y)							
Carbon sink potential - High - Improve							-140
plantations (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-864
retention of HWP (1000 tCO2e/y)							
Carbon sink potential - High - Increase							-356
trees outside forests (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-62.1
cropland (1000 tCO2e/y)							
Carbon sink potential - High - Reforest							-886
pasture (1000 tC02e/y)							
Carbon sink potential - High - All (not							-5,324
counting overlap) (1000 tCO2e/y)							-,
Carbon sink potential - High - Restore							-546
productivity (1000 tC02e/y)							0-10
Land impacted for carbon sink potential -							3.08
Low - Accelerate regeneration (1000							3.00
= ,							
hectares) Land impacted for carbon sink potential -							140
							140
Low - Avoid deforestation (over 30 years)							
(1000 hectares)							0/0
Land impacted for carbon sink potential -							260
Low - Extend rotation length (1000							
hectares)							

Table 73: REF scenario - PILLAR 6: Land sinks - Forests (continued)

Land impacted for carbon sink potential -	2020	2025	2030	2035	2040	2045	2050 25.8
Low - Improve plantations (1000							25.8
hectares)							
Land impacted for carbon sink potential -							(
Low - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							17.8
Low - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							2.05
Low - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							4.36
Low - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							110
Low - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							563
Low - Total impacted (over 30 years)							300
(1000 hectares)							, ,
Land impacted for carbon sink potential -							4.6
Mid - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							144
Mid - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -							470
Mid - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							38.8
Mid - Improve plantations (1000 hectares)							
Land impacted for carbon sink potential -							(
Mid - Increase retention of HWP (1000							
hectares)							
Land impacted for carbon sink potential -							25.8
Mid - Increase trees outside forests (1000							20.0
hectares)							
Land impacted for carbon sink potential -							3.08
							3.00
Mid - Reforest cropland (1000 hectares)							01.0
Land impacted for carbon sink potential -							31.
Mid - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							22
Mid - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							938
Mid - Total impacted (over 30 years) (1000							
hectares)							
Land impacted for carbon sink potential -							6.1
High - Accelerate regeneration (1000							
hectares)							
Land impacted for carbon sink potential -							14
High - Avoid deforestation (over 30 years)							
(1000 hectares)							
Land impacted for carbon sink potential -		+	+				67
							07
High - Extend rotation length (1000							
hectares)							
Land impacted for carbon sink potential -							51.
High - Improve plantations (1000							
hectares)							
Land impacted for carbon sink potential -							(
High - Increase retention of HWP (1000							
hectares)							

Table 73: REF scenario - PILLAR 6: Land sinks - Forests (continued)

Item	2020	2025	2030	2035	2040	2045	2050
Land impacted for carbon sink potential -							33.8
High - Increase trees outside forests							
(1000 hectares)							
Land impacted for carbon sink potential -							4.11
High - Reforest cropland (1000 hectares)							
Land impacted for carbon sink potential -							25.2
High - Reforest pasture (1000 hectares)							
Land impacted for carbon sink potential -							181
High - Restore productivity (1000							
hectares)							
Land impacted for carbon sink potential -							1,130
High - Total impacted (over 30 years)							
(1000 hectares)							